NONPOINT SOURCE WATER POLLUTION

(102-4)

HEARING

BEFORE THE

SUBCOMMITTEE ON
INVESTIGATIONS AND OVERSIGHT

OF THE

COMMITTEE ON
PUBLIC WORKS AND TRANSPORTATION
HOUSE OF REPRESENTATIVES

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NONPOINT SOURCE WATER POLLUTION

WEDNESDAY, MAY 1, 1991

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT,
COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:34 a.m. in room 2167, Rayburn House Office Building, Hon. Robert A. Borski (chairman of the subcommittee) presiding.

Mr. BORSKI. The subcommittee will come to order.

Today the Subcommittee on Investigations and Oversight examines the impact nonpoint source water pollution is having on the water quality of our Nation's rivers, lakes, and other waters. We will focus on the results of a General Accounting Office report that was requested by the Subcommittee on Investigations and Oversight in January of 1989. That report [1] will review the progress being made by the Federal, State, and local governments in controlling nonpoint source pollution.

This committee is proud of the role it has played in approving the water quality of our Nation's waterways. Over 40 years ago, the House Public Works Committee enacted comprehensive Federal water pollution control legislation for the first time. The Water Pollution Control Act of 1948 was the first Federal statute to provide State and local governments Federal funds to help clean up water pollution.

We have come a long way since 1948 and have made great strides, especially since enactment of the 1972 Clean Water Act. Roughly $75 billion has been spent by the Federal, State, and local governments to build wastewater treatment plants to control point sources of water pollution. We must make sure we protect the tremendous investment we have committed as a Nation to cleaning up our Nation's waters. Now is not the time to shrink from our commitment to provide clean water for the citizens of our country.

As EPA Administrator William Reilly said in testimony before our committee on March 20, 1991,

> Contaminated runoff from agricultural and urban areas, mining and forestry operations, and industrial sites is today's single most significant remaining source of water pollution.

It is time for the Federal Government to devote the requisite resources needed to address nonpoint source pollution.

[1] The GAO Report may be found beginning on page 115.

The 1987 amendments to the Clean Water Act established section 319, which authorized $400 million for States to identify waters that are adversely affected by nonpoint source pollution and establish control programs to improve water quality. To date, less than $80 million has been spent to implement the section 319 program. This is unacceptable. This type of effort does not meet the objectives of the Clean Water Act to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.

We expect to hear in today's testimony from the General Accounting Office that little progress is being made to control nonpoint sources of water pollution, that EPA can and should do a better job. In defense of EPA, I do not believe they have been given all the tools with which to properly implement section 319 of the Clean Water Act. We need to change that.

Finally, we will hear from the States of New Jersey, Delaware, and Idaho about what progress they are making in trying to control nonpoint sources of water pollution. Ultimately, it will be the States that establish meaningful nonpoint source control programs. We need to find out how the Federal Government can encourage those efforts.

I wish to thank the representatives from GAO, EPA, and State water quality agencies for appearing at today's hearing.

At this time, I'd like to recognize the distinguished subcommittee's ranking Republican member, the gentleman from California.

Mr. PACKARD. Thank you, Mr. Chairman.

I want to express my sentiments that relate very closely to what you have said in your opening statement, and I certainly want to join with you in welcoming our witnesses here today that will be testifying before us.

Mr. Chairman, as the subcommittee meets today, almost two decades after the enactment of the Federal Water Pollution Control Act amendments of 1972, many of the Nation's surface waters still remain severely contaminated. We've made substantial progress, as you've stated, through the investment of tens of millions of dollars in Federal funds in municipal sewage treatment plants and reduction in industrial waste discharges, but despite those successes, we find ourselves still playing catch-up on clean water. The reason: nonpoint sources of pollution.

As today's testimony will reveal, we may have saved the worst until last. For a variety of reasons—economic, engineering, and political—nonpoint source water pollution is a difficult problem to tackle, yet it seems clear that greater resources must be devoted to control efforts if we are to better approach, much less achieve, the goals of the Clean Water Act. Our hearing today affords us an opportunity to identify some of the shortcomings in the Nation's response to nonpoint source pollution and assess the need for change or redirection of the Federal effort in nonpoint source control and cleanup.

I look forward to the views of our witnesses and certainly to a productive session this morning.

Thank you, Mr. Chairman, for calling the hearing and particularly for starting it on time. We often find committees don't do that; in deference to our witnesses, but we're very pleased that this

committee and this chairman doesn't do that, and I appreciate it very much.

I would like to offer for the record the statement of the Honorable John Paul Hammerschmidt, Ranking Member of the Committee on Public Works and Transportation.

Mr. BORSKI. Without objection, so ordered.

[Mr. Hammerschmidt's prepared statement follows:]

STATEMENT OF HON. JOHN PAUL HAMMERSCHMIDT

Thank you, Mr. Chairman. I am pleased to join with you and the ranking Republican, Ron Packard, as the Subcommittee on Investigations and Oversight undertakes an examination of nonpoint source water pollution.

Many experts feel that until we get a better handle on nonpoint sources, our efforts to clean up the Nation's waters and meet the goals of the Clean Water Act will continue to be frustrated. While enormous progress has been made through the construction and upgrading of municipal sewage treatment plants and clamping down on industrial discharges, much work remains to be done.

Mr. Chairman, I am mindful that much of that work potentially involves changing our adapting land use patterns, agricultural and silvicultural practices, and urban development as we seek to control water pollution from nonpoint sources. That work will not be easily accompanished.

I congratulate you, Mr. Chairman, for scheduling today's hearing. I am certain that the subcommittee's findings will dovetail quite readily into the larger work being undertaken by the Water Resources Subcommittee in Clean Water Act reauthorization. I look forward to the testimony of today's witnesses as an integral part of that effort.

Thank you, Mr. Chairman.

Mr. BORSKI. I thank the gentleman for his comments, and I'd just like to reiterate as long as he's here on time and I'm here on time, we will get started on time.

Are there other opening statements?

[No response.]

Mr. BORSKI. Our first witness today is Mr. Peter F. Guerrero, Associate Director for Environmental Protection Issues at the U.S. General Accounting Office.

Mr. Guerrero, will you please rise and raise your right hand?

[Witness sworn.]

Mr. BORSKI. Mr. Guerrero, you may begin, and if you will, introduce your associates for the record.

TESTIMONY OF PETER F. GUERRERO, ASSOCIATE DIRECTOR, ENVIRONMENTAL PROTECTION ISSUES, U.S. GENERAL ACCOUNTING OFFICE, WASHINGTON, DC, ACCOMPANIED BY STEVE ELSTEIN, ASSISTANT DIRECTOR FOR WATER ISSUES; AND RON MORGAN, SENIOR EVALUATOR FOR WATER ISSUES

Mr. GUERRERO. With me today is Mr. Steve Elstein, who is my Assistant Director for Water Issues, and Ron Morgan on my right, who is one of my senior evaluators for water issues.

Mr. Chairman, we appreciate the opportunity to be here today to discuss our report on nonpoint source pollution. That report essentially examined two issues: first, the barriers that are inhibiting State and local nonpoint control efforts, including conflicts between Federal agencies and State water quality goals; and second, actions that the EPA can take to better focus Federal efforts on reducing nonpoint source pollution. Today we will also provide observations about the likely impacts of the President's fiscal year 1992 budget request on EPA's efforts to address this important issue.

In summary, we found a number of key barriers that impede State and local governmental efforts to deal with nonpoint source pollution: the absence of water quality criteria and standards, the lack of good data on nonpoint pollution, and Federal policies that were often at odds with State and local efforts to control nonpoint pollution. To deal with these barriers, EPA has developed an ambitious five-year agenda. However, midway through that five-year period, it is clear that the agenda will remain largely unfulfilled.

Resource constraints are an underlying problem, as they are in many other EPA programs. In this case, however, we believe the limited resources for nonpoint source control activities reflect an inappropriate emphasis on the agency's point source pollution control programs at the expense of its nonpoint source programs. We believe that the President's proposed fiscal year 1992 budget request for EPA further increases the imbalance.

Before I discuss our findings in more detail, I would like to briefly provide some background information about our Nation's nonpoint source pollution problem and EPA's role in helping to solve the problem.

According to EPA, the Nation's remaining water quality problems are largely attributable to pollution from nonpoint sources. Nonpoint source pollution is a byproduct of a variety of land use practices, including farming, timber harvesting, mining, and construction. It also results from the urbanization of what were once largely rural lands, increasing the amounts of urban runoff into our estuaries, streams and lakes. Agricultural practices account for the largest share of the Nation's nonpoint source pollution, affecting about 50 to 70 percent of assessed waters through soil erosion from crop lands and overgrazed range lands and from runoff of pesticides and fertilizers.

We identified a number of key barriers that impede State and local efforts to control nonpoint source pollution. Chief among these barriers is the fact that some Federal activities and policies conflict with the Clean Water Act's objective to protect and restore the quality of the Nation's waters. For example, USDA's Commodity Price and Income Support Programs encourage farming practices that contribute to soil erosion and nonpoint source pollution, problems that were acknowledged by the Congress in the recently enacted farm legislation. Other agencies whose activities significantly affect nonpoint source pollution control efforts include the Department of Interior, which regulates mining activities, and the Department of Transportation, which funds highway construction projects.

As the Federal agency primarily responsible for implementing the Clean Water Act, EPA is uniquely situated to help control nonpoint source pollution. EPA acknowledges this responsibility in its 1989 report entitled "Nonpoint Sources: Agenda for the Future." In that report, the EPA declared that its goal is to provide strong leadership for the National Nonpoint Pollution Control Program and to help State and local governments overcome barriers to successful implementation of nonpoint source measures. However, resource constraints will prevent EPA from providing the leadership that is required here.

For example, EPA's agenda underscores the importance of the agency's role in developing a stronger partnership with other Federal agencies such as USDA to ensure that Federal programs are consistent with State nonpoint source control programs. To accomplish this objective, EPA chairs an inter-governmental nonpoint pollution task force that is supposed to bring together numerous agency officials to discuss nonpoint source conflicts and opportunities for inter-agency cooperation.

However, the task force has not met since October of 1988. According to EPA officials, resource constraints have prevented the agency from pursuing the problem beyond limited efforts that mainly deal with agriculture-related nonpoint pollution. Severe limitations on staff and resources have also affected EPA's efforts to develop better nonpoint source pollution monitoring techniques, assist States in developing water quality standards, and perform other critical functions identified in its agenda.

Because of limited budgetary resources, it is important that EPA consider the risks posed by alternative pollution problems in deciding where to put its resources. However, despite the emergence of nonpoint source pollution as the Nation's primary water pollution problem, EPA's budget priorities have been overwhelmingly directed toward point source problems. The agency's own risk analysis suggests that this strategy ought to change. An August 1989 report, for example, concluded that ecological risks posed by nonpoint source pollution are substantially more serious than those posed by pollution discharges from point sources. A September 1990 report by EPA's Science Advisory Board reached similar conclusions.

However, EPA has given priority in water pollution control to funding point source pollution activities. For example, during the last four years, EPA had requested only $22 million out of the $400 million that Congress had authorized for the funding of State management grants. To help correct this funding imbalance, we recommended that EPA identify appropriate funding levels that better reflect the risks posed by nonpoint source pollution and that will allow the agency to pursue key elements of an effective nonpoint source agenda.

We emphasize we were not seeking a wholesale revision in the agency's water quality budget, but that some shift in priorities could go a long way toward allowing EPA to implement its agenda and provide increased assistance and leadership to State and local nonpoint programs. Unfortunately, the 1992 budget request furthers the funding imbalance between EPA's point and nonpoint source programs. Despite the compelling rationale for increased priority for nonpoint source pollution control, the President's budget proposes a cut of about 50 percent in section 319 grant funds for the States from the fiscal year 1991 level.

Not only does the budget request inadequately support State programs, it also undermines EPA's ability to meet its own responsibilities under the program. An EPA memorandum indicated that insufficient EPA staff exists to oversee the $51 million that were authorized last year by the Congress for the nonpoint source grants and that the program is vulnerable to fraud, waste, and abuse as a consequence. It noted that the program's vulnerability will increase because additional nonpoint source responsibilities have

been added under the Coastal Zone Management Act amendments of 1990 while staffing has remained constant.

In summary, Mr. Chairman, progress in attaining the Nation's water quality goals will be difficult until nonpoint source pollution is effectively addressed. We believe that EPA's nonpoint agenda points the agency in the right direction, but misdirected budget priorities overemphasize point source pollution at the expense of nonpoint source pollution. We believe that the President's fiscal year 1992 budget provided EPA a key opportunity to more closely align its water pollution activities based on risk. However, as this opportunity was ignored, Congress may need to assure that a better balance is struck in funding point and nonpoint pollution control activities.

Mr. Chairman, this concludes my prepared statement, and we're available to answer any questions you may have.

Mr. BORSKI. Mr. Guerrero, I want to thank you for your statement and for your report. As always with GAO, it is very thorough.

What was EPA's response to the findings and recommendations in your report?

Mr. GUERRERO. EPA pointed out in their response that they were undertaking a number of activities that we had indeed recommended they do, that they were involved in public education and getting the information before the public regarding the seriousness and the nature of the nonpoint source problem. EPA indicated that it was continuing efforts to assist the States in developing water quality standards and to issue important water quality criteria that were needed in this area—for example, criteria pertaining to sediment and biological criteria.

On the other hand, EPA did indicate that it felt that this Nation's investment in point source control activities needed to be maintained and that that investment was an important investment, that its activities were rightfully directed largely in that regard, and that it felt it had made a significant effort to increase the funding available for nonpoint source pollution, in particular the section 319 grants.

Mr. BORSKI. I would assume you have no argument with EPA's suggestion that we need to continue investment in point source pollution.

Mr. GUERRERO. We do not. We do believe, though, having observed in our report, that in 1990, for example, of the budget allocated to both point and nonpoint sources, only 6 percent was directed toward nonpoint pollution activities. We feel that given the fact that by EPA's own admission nonpoint source pollution accounts for some half of the pollution in estuaries, some three-quarters of the pollution in lakes, and so forth, given the magnitude of the problem remaining, that 6 percent is inadequate.

Mr. BORSKI. So you would say that generally their——

Mr. Elstein, did you want to comment?

Mr. ELSTEIN. Yes. The only thing I'd like to add is that we took pains to emphasize in the report as well as in the statement that we're not suggesting a wholesale revision of the budget is in order. We talk about risk, and we note that nonpoint represents the larger share of risk. That's not to suggest that it should also represent the larger share of the budget. What we are suggesting,

though, is that nonpoint is so vastly underfunded in relation to point source pollution that even some modest revision to the budget to put some additional funds in the nonpoint program will certainly give the taxpayer a lot more bang for the buck in its pollution control.

Mr. BORSKI. Did you get a direct response to that question as to why the request for funding was 50 percent less than the previous year?

Mr. GUERRERO. The only information we have is what is contained in the President's budget, which is largely an assessment that this is primarily an activity that is best directed by the States and localities, that the Federal role should be a minimal role.

Mr. BORSKI. Is that EPA's position?

Mr. GUERRERO. I believe that's OMB's position, but I think EPA can speak for that when they testify.

Mr. BORSKI. How much money should EPA be devoting to help clean up nonpoint source pollution based on the health and environmental risks posed by nonpoint pollution?

Mr. GUERRERO. We don't have an exact number to recommend. As Mr. Elstein suggested, we believe that the 6 percent is woefully inadequate. What amount would prove to be adequate? We don't have a specific recommendation, but I do have two observations I'd like to make in terms of assisting you in making that determination.

The first is the ability of the States themselves to absorb additional grant funds has to be taken into account. There are limits in terms of allowing those programs to grow. Those programs are largely new, they're getting off the ground, they do need additional assistance, but there is probably a limit to which they could absorb additional grant funds, and I think perhaps EPA might be able to provide some guidance as to how much additional grant funds they could productively use at this time.

I think a second consideration that has to be taken into account is EPA's own ability to oversee any additional funding in this regard. EPA now feels that it is perhaps stretched to the limit, that it doesn't have adequate staff to oversee the $51 million that were appropriated last year by the Congress. If that's the case, then I think that's an important limiting factor as well that has to be taken into account, especially, as I indicated in my testimony, in light of the fact that they have now assumed additional responsibilities under the Coastal Zone Management Act without any increase in staff.

Mr. BORSKI. Can the Federal effort be increased without sacrificing the progress we've made in controlling point source pollution?

Mr. ELSTEIN. I would say that progress can certainly be made. I think the only way you would run into a problem would be if in fact you did undertake a wholesale revision of the budget. Point source programs are funded on the order of billions. We're suggesting that even if you were to appropriate the fully authorized amount, that would be an additional $20 million over the President's budget proposal.

I grant you that there are problems in funding wastewater treatment plants and related needs, and we at GAO consider that a problem. We've got reviews under way to address just those prob-

lems. Again, the question is bang for the buck, and if you reoriented some of the funds from the proposal, not to exceed an unduly large amount, I think that you could proceed with point source controls in place as well.

Mr. GUERRERO. What I'd like to add to that is I think we can provide some additional resources for nonpoint pollution, and I think we need to, given the magnitude of the problem. I think the amounts we're talking about are relatively small compared to the amounts that we now have allocated to point source pollution. But I'd like to add that in other work that we're doing, we are looking at the State revolving funds and other areas. It's clear to us that the amounts that are available over the next few years into the next century to continue the progress that we've made to date are inadequate, that there are substantial amounts of bills coming due to replace and build wastewater treatment facilities. EPA has come up with an estimate of about $83.5 billion for that effort, and we think that's understated to some extent.

So this is not to suggest that there is not a serious remaining point source pollution problem. It's merely to indicate that we need to strike a better balance between the two activities.

Mr. BORSKI. What has prevented EPA from better implementing the Clean Water Act section 319 Nonpoint Source Grant Program?

Mr. GUERRERO. I think the most serious constraint is EPA's own lack of staff resources to effectively oversee those grants and to provide the leadership in other areas that it needs to, in particular, to provide effective interagency coordination to ensure that Federal agency policies and programs are not inconsistent with the State water quality goals and also to provide leadership in helping to developing monitoring methods and water quality criteria that are necessary to implement the program.

Mr. BORSKI. You mention in your testimony an agency Task Force that EPA set up to better coordinate all the Government activities in the program, but it hadn't met since 1988?

Mr. GUERRERO. That's right.

Mr. BORSKI. What was EPA's response to that?

Mr. GUERRERO. EPA's response was that although that may be true, there were ongoing efforts and continuing efforts to coordinate, and we recognize that in fact there have been, but we believe that EPA could assert a more direct and stronger role in this regard if it had additional resources to do so.

Mr. BORSKI. Are any EPA regions taking a leadership role in trying to better implement the section 319 program?

Mr. ELSTEIN. Well, it varies by region, and one thing to point out about the nature of the nonpoint source pollution problem is that the type of nonpoint problem that exists varies substantially by region, so what you've got is in Region 10 in the northwest, there are some States doing some interesting things to deal with silvicultural pollution, pollution from timber harvesting. We found in our work that the State of Maryland is doing some interesting things to deal with control of stormwater pollution.

The work we did largely focused in two or three regions, and based on that there were some interesting things going on. I couldn't really tell you that any one particular EPA region really stood out overall.

Mr. BORSKI. In your opinion, could EPA be establishing national pollutant criteria and effluent limitations for nonpoint sources, as they have for point sources?

Mr. GUERRERO. I think it's up to EPA to exercise the same leadership role for nonpoint sources that they have in that regard in the past for point sources. Yes, they should be out in the forefront helping to establish that criteria and then assisting States in developing water quality standards to implement the criteria. EPA has done some work in that regard, but we think that process could be moving along quicker, and more assistance could be provided to the States if EPA had additional resources.

Mr. ELSTEIN. I would just add that the EPA strategy to date has been to focus on those activities for which they felt there were statutory mandates to do so, and as such they focused their efforts thus far primarily on setting standards and criteria for point sources. Having made some progress with that, they're now proceeding more and more with those activities as it relates to nonpoint sources, and they're moving ahead, but, of course, the progress that they're making is limited by the resources available.

Mr. BORSKI. Do you think that EPA is not using more money or requesting more money for budgetary reasons, because the problem is too difficult to get a handle on, because point source pollution is easily identifiable? Would you venture a guess?

Mr. GUERRERO. I don't think it's the technical challenge that prevents EPA from putting more resources in this area. I think there is a policy difference of agreement in this regard, and I think largely it's the Administration's position that this is largely a State and local issue.

As you know, Mr. Chairman, getting to the heart of controlling nonpoint source pollution are fundamental questions about land use, and there are many people who feel very strongly that land use is indeed the domain of localities and perhaps States. From our perspective, we have seen public opinion shift on this. We have seen in particular, as EPA and the States surrounding the Chesapeake Bay have made efforts to clean up the Chesapeake Bay, as well as changes reflected in the farm legislation passed by the Congress, there is increased understanding by the public that those tough and difficult land use issues do need to be tackled eventually.

But I believe that at the heart of the issue here is really a fundamental difference of opinion as to what role the Federal Government should play in such issues.

Mr. BORSKI. Do you believe that that's budgetary driven at all?

Mr. GUERRERO. I believe it's reflected in the budget.

Mr. BORSKI. Mr. Packard.

Mr. PACKARD. Thank you, Mr. Chairman.

Thank you, Mr. Guerrero, for appearing and for your testimony.

A lot has been said about agricultural contribution to the problem of nonpoint pollution, yet some of the statistics still seem rather vague in this area. I'd be interested in your observations as to what contribution agriculture is making, if in fact it is the primary problem. In your testimony you referred to assessed waters, and I don't know exactly what assessed waters are.

Mr. ELSTEIN. Assessed waters refers to an inventory EPA takes every couple of years of the quality of the Nation's waters based on

what the States report to them. Not all waters are assessed. They just can't do that. Of the waters that are assessed, they try to get a panorama view of the quality of the Nation's waters. Based on the input that EPA has had, yes, agriculture does account for a large share. I would just suggest—and perhaps EPA can speak to this point as well—that the numbers that you might have seen, the precise percentages, are anything but precise. I think that there is certainly a scientific consensus that agriculture does represent a lion's share. The exact percentages I don't think anybody really knows.

Mr. GUERRERO. In our report, we said that about 50 to 70 percent of the assessed waters were adversely affected by agricultural nonpoint pollution. My understanding is that EPA has some additional information perhaps that can shed light on that, but that data largely comes from the States themselves.

Mr. PACKARD. What effect will the Farm Bill of 1990 have on cleanup processes and reducing agriculture's contribution to the problem?

Mr. GUERRERO. We believe it's certainly a step in the right direction. Among other things, the elevation of these issues to an Office of Environmental Quality is an important step. We believe the establishment of certain programs and the continuation of other programs such as the Agricultural Water Quality Protection Program, the Integrated Farm Management Program, and the Wetlands Program are also indeed very important steps in the right direction that will have a very positive impact.

We also believe despite that movement in the right direction that EPA still needs to play a leadership role here. It needs to work very closely with USDA and other Federal agencies, and to play that leadership role it needs increased resources and staff.

Mr. PACKARD. I'd be interested in your evaluation as to how the Federal Government ought to interplay with the states' efforts in trying to solve the problems. How much of the problem should be resolved by the states themselves exclusive of Federal pressures and Federal mandates, and what efforts should the Federal Government do in terms of the solutions to the problems as well?

Mr. GUERRERO. I think the Federal Government should not play a role in land use decisions, for example, which fundamentally are at the heart of this issue. That's for the States and the localities to address. But the Federal Government can play what is more typically and traditionally its rightful role, and that is to provide leadership, and the kind of leadership that we think EPA can provide is to help the States by establishing nonpoint source criteria, by helping the States establish water quality standards for nonpoint pollution and to help the States in developing and implementing effective monitoring systems, because nonpoint source pollution is very different from point source pollution and requires different standards and different monitoring techniques.

Finally, perhaps the most important thing EPA can do is to ensure that there is coordination among Federal policies and programs in the Federal agencies so that their activities are not inconsistent with what the States are trying to accomplish under their own management plans.

So those are key, important areas that are very consistent with the EPA's role and the Federal Government's role in the water

quality area, and it could carry through in the nonpoint source area that would not conflict with what the States and localities would be expected to do. But EPA cannot now perform this effective role because it doesn't have the resources to do it.

Mr. PACKARD. Are we getting resistance from agriculture as an industry? Are we getting resistance from industry generally that is non-agricultural in nature in trying to meet the mandates and the requirements and the goals of both EPA and State regulatory agencies?

Mr. ELSTEIN. That's a difficult question to answer in a black-and-white fashion. I think that depending upon who you talk to, you'll hear that the farm industry is in an earlier generation, oblivious to the concerns we now hear about water pollution. I think you'll hear from the farm community that they live in those areas and they've got to drink the groundwater that people are concerned is getting polluted because of nonpoint source pollution.

Quite honestly, I think that the answer is probably somewhere in the middle. I think that the country has undertaken farming practices, and there's a lot of momentum. It's difficult to change the way farming has taken place overnight. I think that there is a legitimate concern for water quality among the farm industry in some sense. It's certainly a question of economics, and it's a question of the fact that it just takes time to reorient an entire industry like the agricultural industry.

Mr. PACKARD. Do we see the quality of water change as climatic conditions of a general area change—for instance, a drought in California, flooding in other parts of the country? Does the runoff or the lack of runoff alter the figures in terms of water quality and nonpoint concerns? Have we got any statistical background to show whether those——

Mr. GUERRERO. We don't have any data on those effects, but you would think that certainly under drought conditions you'd have more concentrated pollution in those surface waters.

Mr. PACKARD. And during flooding or heavy rains you'd think that street and road runoff might also have an effect. But we have done no real statistical data on that?

Mr. MORGAN. Well, we do know that at times when you have a great deal of rain after you've had a long dry spell, there's a great deal of pollution in the initial amount of water that comes through the drainage pipe. So, yes, there is definitely a varied amount of pollution. Later on, the pollution levels would drop down after the initial washing of the land.

Mr. PACKARD. Is there any remedial action to be taken to address that problem? That is not something you could really impose upon industry or agriculture to change water quality levels. Those are just things that happen that we apparently have to live with. Is that true?

Mr. MORGAN. Well, I think perhaps in urban areas you could have a problem in which you put down too much fertilizer and that washes out at that particular time. Street cleaning would prevent a lot of pollution from getting into storm water, and I think that's part of the management programs that communities could install to prevent pollutants from getting into stormwater.

Mr. GUERRERO. I think an important point here is that there are differences from urban areas and rural areas as to the contribution and the type of contribution to nonpoint source pollution each provides and that it's really part of the 319 process to allow the States to assess those problems and to come up with management plans that address those differences and the unique contribution of each to the overall problem.

Mr. PACKARD. Is it EPA that monitors and polices the industries and the agricultural business in terms of compliance? Who does the monitoring?

Mr. ELSTEIN. Well, there's very little with which to comply in terms of controlling nonpoints. I think it's the nature of the problem and certainly the nature of the regulatory framework in place. I would say that in terms of the difficult urban runoff problem you alluded to, EPA is in the process of setting into place a stormwater control program, and perhaps they can comment on precisely where that is. It's an extremely difficult problem to control. Quite honestly, I'm glad I'm not running that program.

Mr. PACKARD. Okay, thank you.

Thank you, Mr. Chairman.

Mr. BORSKI. The gentleman from Florida, Mr. Peterson?

Mr. PETERSON. Thank you, Mr. Guerrero, for your testimony.

I'm a new guy on this nonpoint source pollution, so bear with me a little bit on some of these maybe elementary questions. Looking at this problem, is this an evolution of what's happened in our pollution in the Nation? That is to say, have we resolved our known pollution sources to the extent that we can now move on to a new problem, or is this something that's always been sitting there and we're just elevating the priorities on it?

Mr. GUERRERO. I think it's always been a problem that's been there, but I think initially what we put into place were programs to address more visible kinds of pollution, pollution from point sources, and that includes not only water, but air. The history of environmental legislation in this country had us begin, and I believe rightfully so, with those very visible and dramatic kinds of problems. The more intractable problems really remain for us to come around to in terms of a better understanding of their contribution, and I think it's a reflection of the progress that we've made in our water pollution control activities to date under both the NPDES Program and the wastewater treatment plant construction efforts that today we're in the position to deal with this more difficult set of problems presented to us by nonpoint source pollution.

Mr. ELSTEIN. I would just add—and I'm sure EPA will certainly add this, too—it's not the kind of thing where you deal with one problem and now you can move on to the next. I think that it's going to be very important to retain our investment in point source control. There are a lot of wastewater treatment plants that need to be upgraded and maintained. It's simply a matter of whether or not, having made the progress that we have made in that area, we can devote some additional amount of resources to deal with this problem now, nonpoint, which now accounts for the majority of remaining water quality problems.

Mr. PETERSON. So essentially we have to prioritize using the dollars that are available, and that's what you were looking at when

you went to EPA, if they were using the proper allocation of resources to attack those two elements of this pollution. Do you feel that they were in fact, given the monies that they have, allocating these resources in a beneficial way for the overall program?

Mr. GUERRERO. We have no quibble with EPA over how they've allocated the resources they've had. The problem we have is that we feel the resources haven't been adequate for the job at hand.

Mr. PETERSON. Okay. One of the things that you mentioned is that their manpower was one of the factors, that they just didn't have the personnel to follow through with some of the programming that they were asked to do. What would it take, in your view, and did you make an analysis of that aspect, in order for them to completely comply with what they were required to do? What kind of an increase in their budget would they have to have to take care of this suggested manpower problem?

Mr. GUERRERO. We haven't come up with any estimates. As I indicated earlier, we believe there is a need for additional resources here to allow EPA to assert its leadership role in tackling this difficult problem. We recognize there are really two constraints, and one is the staffing constraint, and one is the ability of the State programs to absorb additional grant funds under 319. However, we don't have a suggestion as to how much in terms of additional funding the Congress should provide for under 319, nor do we have any suggestions for how many more staff EPA needs.

I believe that's an important question to ask EPA, who will be testifying today, because they're in the process now of trying to handle a number of things and keep a number of balls in the air. They've got the Coastal Zone Management Act regulations they're trying to promulgate at the same time they're trying to effectively oversee these State grants, and I think they're pretty well positioned to tell you whether they're able to do that well and how much more resources they would need to do that.

Mr. PETERSON. Okay. On the overall pollution, can you—perhaps I should reserve that question for EPA, but is there a geographic hot spot map that one could address and say that this area is the area that has the most nonpoint source pollution versus another and therefore prioritize even the attack on the problem?

Mr. ELSTEIN. I think that that probably would be a good question for EPA, but I think that you can certainly assume that major urban areas experience a great deal of the urban runoff problem we talked about, the stormwater problem. In farming States—I know that Iowa had become extremely concerned about pesticides contamination of groundwater and had undertaken some policies to deal with that. Just by its nature it's a very diffuse problem, and it differs no matter where you go around the country, but one thing about this particular problem is it is something that we all have to deal with.

Even in the suburbs now we're hearing more and more about an increased use of lawn care pesticides. A lot of these lawn care pesticides do more than kill the dandelions—there was just an article in The Post a day or two ago about how these pesticides are finding their way into drinking water supplies. It's a very pervasive problem.

Mr. GUERRERO. I would agree that nonpoint source pollution is a problem across the board. In terms of whether there are hot spots, I think what happens is you have specific areas that have unique kinds of nonpoint source problems. If you're in a largely agricultural area, it could be agricultural runoff from use of fertilizers, pesticides, and so forth or type of crop rotation or lack of crop rotation that increases soil erosion. If it's in a timber harvesting area, it could be due to timber practices. If it's in a largely urban area, it could be from waters being washed off of streets and into areas like tributaries that would feed ultimately the Chesapeake Bay and carry contaminants into those types of estuarine areas.

So the problem varies, and I think EPA does have some hope of using emerging technologies such as computer mapping that will allow it to create visually a sense of where these problems are and to what intensity and to what magnitude they exist in different areas to allow it to set reasonable kinds of priorities, and I would think that the States also, in coming up with their plans, would be thinking along the same lines. The State officials who are testifying here today perhaps can talk about how they plan to deal with that particular issue of how they deal with locating hot spots and particular problems, because certainly the problem is going to vary from location to location.

Mr. PETERSON. Well, that was where I was coming from on that, and I'll finish up with just one more.

The obvious agricultural impact on this is very significant, with 50 to 70 percent of this. Is the USDA in a cooperative stance in this addressing process with EPA, or did you find them to be in an adversarial role?

Mr. ELSTEIN. I think it's fair to say that USDA—and we didn't have a great deal of direct contact with USDA, but we did have some—certainly they were cooperative with us, and I think overall there is some inherent bureaucratic resistance within the agency. Looking at its water quality initiative, I think it calls for a lot of change within an agency that isn't necessarily used to a great deal of change over a short period of time, but I think it is also fair to say that within the agency there is a genuinely increased awareness of the water quality problems that agriculture by its nature causes. I think it's probably more a matter of how long that process plays out rather than whether it takes place.

Mr. PETERSON. Thank you, Mr. Chairman.

Mr. BORSKI. I thank the gentleman.

I would like to remind members that we will try to operate under the five-minute rule. Perhaps I set a slow pace myself at the beginning.

The gentleman from Oklahoma, Mr. Brewster.

Mr. BREWSTER. Thank you, Mr. Chairman.

I just have a few questions here. It seems like all our questions are on agriculture. On page 3, once again the 50 to 70 percent nonpoint source pollution from agriculture, is there documentation on that? Can you provide me some kind of documentation on that? What are we talking about? Fifty to 70 percent of what?

Mr. MORGAN. This is really 50 to 70 percent of waters that have been actually evaluated. There are a lot of waters throughout the country that have not been evaluated, and this is based upon

EPA's combined report, in which they get most of the information directly from the States. Again, it is not a complete picture. Some of the States report a great deal more information than other States.

Mr. BREWSTER. Okay. The way this is written, it actually plays it as fact rather than saying "EPA reports this."

Another question. What are we talking about? Chlorides, nitrates, phosphates? Is there a baseline study from 30 years ago to show those have increased, or have those streams always been high in chlorides or nitrates?

Mr. ELSTEIN. I don't think we have any trend lines for that type of question. Perhaps EPA might have some more technical information along those lines.

Mr. BREWSTER. Okay. The next thing is we have overgrazed range lands in there. What kind of pollution would that cause in our streams?

Mr. GUERRERO. I think you're largely talking about erosion of soils.

Mr. BREWSTER. What kind of pollution would soil erosion cause in the streams?

Mr. GUERRERO. Siltation, which would have the effect of smothering marine life—for example, destroying the lower vegetation and areas where fish would breed and so forth.

Mr. BREWSTER. I know the area in Yellowstone and the Grand Canyon certainly had soil erosion long before there was any grazing, and I'm kind of curious if we can document those particular points that are in here as fact. Just a point of view: at least in Oklahoma, our people would feel that EPA would be an awfully good place to start trying to balance the budget.

Mr. BORSKI. I thank the gentleman.

The gentlewoman from New York, Ms. Molinari.

Ms. MOLINARI. Thank you, Mr. Chairman.

I'm sorry I was late in hearing some of your testimony, but in reviewing your written testimony, you state that one area you have problems with EPA is the fact that they have spent a large portion of their budget toward controlling point source pollution rather than nonpoint source pollution, the majority of that going toward the upgrading of wastewater treatment plants. Clearly, coming from New York City, I'd like to see it stay that way.

I guess my question comes in, though, in trying to analyze how you differentiate between nonpoint source pollution and point source pollution in an area like New York City or those large urban areas, where once a combined sewer overflow or even wastewater that goes into a catch basin ends up in a wastewater treatment plant, one problem becomes the other. So I'm having a hard time making that clarification between nonpoint source and point source in an urban area, and perhaps you could clarify for me where you make that differentiation and therefore why EPA's budget is inappropriate.

Mr. ELSTEIN. I think that you're putting your finger on one of those unusual problems. In a sense, when urban runoff is captured by a stormwater system it is classified as a point source. We look at it as a nonpoint problem that has a point source control solution,

and, again, I referred earlier to EPA's upcoming Stormwater Control Program, which is intended to deal with that.

Ms. MOLINARI. So in that case, then, GAO may not think that those Federal dollars are inappropriately spent because they are, by your definition, not controlling nonpoint sources?

Mr. ELSTEIN. Well, yes. As a matter of fact, EPA looks at pollution like that as "non-conventional point sources." In terms of priority, again, it's difficult to say in terms of bang for the buck. Certainly we think urban runoff is a serious problem. Could those marginal dollars be better spent in another activity? That's a little difficult for us to say. In a sense, it's a very technical question.

Mr. GUERRERO. I think our observation on the relative priority that nonpoint has vis-a-vis point source control activities stems from our observations about the past funding where it accounts for approximately 6 percent of the budget and yet accounts for, in many cases, the majority of the remaining water quality problems that prevent attainment from being reached not only in rivers and lakes, but also estuarine areas. Because of that, we suggested that there's a need to strike a better balance.

Does that mean robbing Peter to pay Paul? I think that presents all of us with some very difficult choices, and you've hit some of those difficult choices right on the head. We recognize, for example, in other work that we're doing in regard to the State revolving funds that the extent to which those funds are now capitalized reflects only a small portion of the total need for future wastewater treatment plant replacement and construction.

So these are indeed difficult balancing questions, and we don't mean to suggest that they're not, but we believe that the magnitude of the dollars that are involved here—we're talking about the President's budget request of some $25 million for nonpoint pollution control in fiscal year 1992, give or take—when you're talking about billions of dollars overall, some shift there that would be relatively small vis-a-vis the total picture would not jeopardize the important point source programs that are under way but would be a very significant increase for the nonpoint activities and allow EPA to provide the kind of leadership it needs to.

Ms. MOLINARI. I see. Thank you.

Thank you, Mr. Chairman.

Mr. BORSKI. The gentleman from Missouri, Mr. Emerson.

Mr. EMERSON. Thank you, Mr. Chairman.

I think it's vitally important in understanding this report—or in considering the report, let me say—that this committee and other committees of the Congress fully understand all sides of the equation, and I want to try to play my part in bringing a level of understanding about the agricultural interests of this country.

It disturbs me that in this report there was no real involvement and consultation with agricultural interests in the heartland. It says you consulted agriculture in Minnesota. I don't know what agricultural interests were consulted, but, you know, the heartland is the vital bread basket not only of this country, but of the world, and it extends from Ohio to Colorado and beyond in some instances, and from Minnesota to Louisiana. You know, you went to Minnesota, as I say, but there's a lot more out there in the heart-

land beyond Minnesota, and I just don't feel that there was a wide involvement of agriculture in this report.

It says that officials at USDA were contacted. I don't know if they were consulted with, I don't know if the people conducting this examination, survey, and writing this report have a deep, broad understanding of agricultural law and policies and practices, and I think that before we start to fix this magnificent agricultural machine in this country, we better understand what's broken and what needs fixing and what isn't broken and what doesn't need fixing.

In my Congressional district down in Missouri, we have some of the most diverse farming operations in the country—everything from cotton and soybeans to wheat, rice, cattle, hogs, and chickens. In my other duties in the Congress on the House Agriculture Committee, I've seen over the years the tremendous job that this Nation's farmers do producing the world's finest grain, produce, textiles, at the most economical prices in the world. We should never lose sight of that fact. Americans spend far less of their disposable income on food stuffs than any other nation in the world.

The farmers in this Nation truly are some of our best conservationists in the whole country, and we should never lose sight of the fact that if farmers abuse the very land that provides them a living or if they abuse the water that they depend upon as their most vital resource, they can't continue to produce economical, efficient food stuffs that each of us places on the kitchen table every night and the textiles that we wear every day.

For all the hard work that these folks do, I'm very concerned that they've taken more than their fair share of the blame for things like pesticide runoff, soil erosion, fertilizer use, and animal waste runoff. These things have been problems, but the agricultural community has made tremendous strides to address them, and they continue to work to implement the best management practices for their land and for their water.

For instance, the EPA's five-year-old water quality inventory has often cited that agricultural runoff is the most extensive source of nutrient contamination to our Nation's lakes and reservoirs, affecting approximately 58 percent of impaired lake acres. However, what usually doesn't get cited is that the more recent water quality inventory from 1988 shows a 10 percent reduction in runoff in just two short years, an achievement for which agriculture has yet to receive any credit at all. This reduction is largely attributable to voluntary implementation of cropping and livestock best management practices and overwhelming support and participation in the Conservation Reserve Program from this Nation's farmers to control soil erosion, the largest of agriculture's contributors to water quality contamination.

Many of the programs that were implemented in the 1985 Farm Bill and fine-tuned in the 1990 bill are not well-known outside the agriculture community. They aren't well-known, and they should be taken notice of because of the tremendous role that they have played in helping to take care of the environment. I've worked closely with the agricultural community to develop new programs, and I can tell you firsthand that our Nation's farmers have heeded

the call to become more environmentally conscious, and they have done so, and they will continue to do even more.

I just think we need to have knowledge of these facts as we move forward, before we beat up too much on agriculture and before we give too much credence to this report. Admittedly, you couldn't talk to everybody, but the people who were consulted, as I read this report, were few and far between when we consider agriculture in its entirety, and the fact that the heartland wasn't consulted very much in this whole report is a matter of very, very serious concern to me.

I have a lot more to say, Mr. Chairman, but in keeping with the five-minute rule, I will desist. Thank you very much.

Mr. BORSKI. I appreciate the gentleman's contribution, and I was just curious as to whom he was referring his question. [Laughter.]

Mr. BORSKI. Thanks, Mr. Emerson.

Are there any other questions? Do any other members have questions?

[No response.]

Mr. BORSKI. If not, we want to thank you very much for your contribution and your report. Thank you for helping our committee.

[Mr. Guerrero's prepared statement appears on page 56.]

Mr. BORSKI. Our second witness this morning is Ms. Martha G. Prothro, Deputy Assistant Administrator for Water, Office of Water Regulations and Standards for the United States Environmental Protection Agency.

Please rise and raise your right hand.

[Witness sworn.]

Mr. BORSKI. Please be seated.

Ms. Prothro, unfortunately, I have a commitment and will have to leave at some point during your questioning. I just wanted to mention that to you now; you may proceed in any fashion you so choose.

TESTIMONY OF MARTHA G. PROTHRO, DEPUTY ASSISTANT ADMINISTRATOR, OFFICE OF WATER, U.S. ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON, DC, ACCOMPANIED BY JEFFREY GRUBBS, DIRECTOR, ASSESSMENT AND WATERSHED PROTECTION DIVISION

Ms. PROTHRO. Thank you, Mr. Chairman and members of the subcommittee. I will give a brief statement here and submit my written testimony for the record.

I want to first of all identify myself as the Deputy Assistant Administrator for the Office of Water. Until a few weeks ago, I was the Director of the Office of Water Regulations and Standards and had responsibility, among other things, for managing the Nonpoint Source Program directly. I have with me here today Mr. Jeffrey Grubbs, who is the Director of the Assessment and Watershed Protection Division, which has responsibility for running this program. Mr. Grubbs is prepared to help me answer questions if that should become necessary.

I first want to commend GAO for the very comprehensive report that they've done on some of the barriers facing EPA and other

parts of the Federal Government, as well as State and local agencies, in our efforts to manage nonpoint source pollution. We think they've really helped to crystalize some of the very difficult issues that we face in striking the right balance between point and nonpoint source control programs and our very difficult issues regarding the role of EPA in striking that balance.

We certainly agree that nonpoint source pollution is a leading cause of what are called impairment and wildlife habitat alteration. EPA believes that our process for setting priorities should be based on reducing risk to the extent practicable, although risk cannot be the only factor in driving our priority-setting. Much of it has to do with what the role of the Federal Government should be in addressing various problems. But we do believe that nonpoint source control programs should continue to receive increasing priority in our budgets, and we have reflected that in our budget requests over the last few years. There has been a steady increase. Some might argue with the rate of increase, but we are increasing our emphasis in that regard.

Under section 319, for example, as GAO has pointed out, we are requesting increased funds. When comparing the President's budgets over the last two years, we have gone from a $15 million increase for fiscal year 1991 to a $25 million increase for fiscal year 1992. While that is less than what Congress appropriated in fiscal year 1991, I think it does show that we are recognizing the increasing importance of nonpoint sources in our programs.

It is true, however, that our budget remains overwhelmingly oriented toward point source problems, largely due to the very specific provisions in the Clean Water Act, many of which involve deadlines which have been enforced against the Agency through litigation (court suits). We're under court supervision in many of our point source activities, which requires us to step up to that in a very direct way, whereas in the Nonpoint Source Program many of our activities are discretionary. It also should be noted that many of the resources devoted to the Point Source Program involve direct funding for wastewater treatment, as GAO has pointed out. We have not played the same kind of role in the Nonpoint Source Program.

We have increased our efforts in many regards. I will not repeat all of the examples given in my testimony, but I do want to point out that there are a number of EPA programs that are not identified directly in our budget as nonpoint source control programs which do support our efforts in this regard. For example, our Office of Pesticides and Toxic Substances has a number of activities under way which will help us in our nonpoint source control efforts. Some of our water body-specific programs like the Great Lakes Program and the Chesapeake Bay Program do expend a good deal of their efforts also in nonpoint source control. So it's a very complex kind of problem to identify not only what activities should be undertaken, but also who should do them even within the EPA.

I wanted to say briefly that there is, as Ms. Molinari pointed out, continuing confusion in some cases about what is a point source and what is a nonpoint source, and I think for purposes of our discussion here today it may be best to use a rather broad definition that we tend to use now inside the agency, which is that "non-tra-

ditional" sources are the problem here. That would include stormwater discharges. Even though they're conveyed through a pipe to surface waters, they're the kind of thing that we haven't traditionally addressed in our point source programs, which have focused on municipal wastewater treatment plants and industrial dischargers. We are in fact not only addressing the literal nonpoint source, the sheet runoff type of thing, but we're increasingly devoting ourselves to combined sewer overflows and storm sewers and those sort of things. So even our permitting program is beginning to do things in the area that support nonpoint source control efforts.

We believe that we have improved our working relationships with a number of Federal agencies, and while we haven't had a meeting of our Federal task force in some time, I think our interaction with individual agencies has actually increased drastically, particularly with NOAA and implementing the new Coastal Zone Management Act and with the Department of Agriculture over the Farm Bill implementation and the President's water quality initiative. We think we've improved in that regard. We're not saying there's not a lot more that we could do. There's a lot more that we would like to do, but we have improved our relationships with some of the very key sister Federal agencies in this regard.

Our goal, by the way, with the land management agencies is to try to ensure that the Federal land managers are setting a good example for private land owners and the way that they manage their lands to protect water quality. So we're trying to instill that ethic as best we can throughout the land management agencies, and many of them are way ahead of us in some respects on this.

We also are working hard to develop the kinds of guidance and assistance that the States need so badly in the areas of monitoring and criteria development, and I'd be happy to answer any specific questions on these things.

I think with that I'll conclude my testimony and try to respond to your questions. I find myself in agreement with many of the things that the GAO witnesses said, so I won't repeat those.

Mr. BORSKI. Very good. Thank you very much for your testimony.

I want to get back to the funding source question, if I may. EPA data indicates our current water quality problems can be largely attributed to nonpoint sources and that the environmental risk posed by nonpoint source pollution is greater than from point sources. Given these facts, how do you justify EPA's fiscal year 1992 budget request that cuts 50 percent from the section 319 Nonpoint Source Grants Program?

Ms. PROTHRO. First of all, let me talk about the risk issue a little bit. Our Science Advisory Board did give us a report and attempted to do some comparative risk ranking. They've recently cautioned us to be very careful how we use their advice to us, because there's not a lot of data and the methodology for comparing risks is not well perfected. But I don't think we have any quarrel with the general view that nonpoint sources are the greatest remaining risk. That's assuming that you continue to control point sources, at least to the extent that we have so far. But that risk mainly relates to the extent to which the problem appears.

From an aerial extent, there are more nonpoint source problems than there are point source problems remaining this country. But we don't have good information yet—we're working to get this—on the severity of the problems. If you compare severity of water quality impairment from point sources to those from nonpoint sources, we may get a somewhat different feel for what the real risks are. So I wanted to just briefly say that, and I don't think we'll have real good information on the comparison of severity for a couple of years.

However, again let me say that we think we are moving in the direction of increasing our commitment to nonpoint sources. I think whether there's a 50 percent cut in the request is in the eye of the beholder. To us it's a $10 million increase over the fiscal year 1991 President's budget. From the point of view of what actually was appropriated in 1991, which was $51 million, then there is a 50 percent cut, but we feel like we've made some progress in getting support within the budget agencies here in the Federal Government to go forward with increasing funds for the Nonpoint Source Program.

Mr. BORSKI. I have trouble understanding the risk posed by nonpoint sources, if in fact $51 million was appropriated last year and yet this year the President is only requesting $25 million. It would seem to me that you would think that the problem was not severe and not important. I appreciate that your requests are up for the last couple of years and from zero, I expect, before that. But when I look at this and see that there was $51 million appropriated last year and you're only asking for $25 million, I find it difficult to believe that you think the problem is as serious as I'm hearing you say it is.

Ms. PROTHRO. Well, again, we don't quarrel with the findings that our States have supplied to us through the 305(b) process and the reports that we have provided on the extent of this problem. I believe the GAO witnesses correctly discussed the fact that there is a philosophical disagreement perhaps among people who are concerned about this problem as to how it should be approached, who should do it, what is the proper role of the Federal Government, and what is the proper role of EPA.

The Federal Government can play a leadership role in some respects in the Nonpoint Source Program, but primarily local and State governments are going to have to address this problem, and that's peculiar in some ways to the Nonpoint Source Program. The problems that occur on a given stream vary greatly from one area of the country to another. There aren't easy national solutions to these problems. There has to be some diagnosis on individual water bodies as to what the primary nonpoint source problems are, whether it be pesticides, soil erosion, abandoned mines, forestry, whatever it may be, and then they need to be designed to suit the special water habitats that are located in those areas.

Land use has traditionally been a responsibility at the lowest levels of government, and we think that's appropriate. We think that our role should be in providing information and the scientific tools to address the problem, but not the kind of regulatory program that we've had in the point source area.

Mr. BORSKI. Perhaps you can help me this way. Could you share with the committee what the EPA request to OMB was for nonpoint source pollution?

Ms. PROTHRO. I honestly don't have that information with me, but I would be able to supply it for the record. I don't have it with me. I believe for the State Grant Program that we did request the $25 million that was included in the President's budget.

Mr. BORSKI. All right. But you will——

Ms. PROTHRO. I will double-check and make sure that's correct.

Mr. BORSKI. If you would, submit that to the committee.

[The information received from Ms. Prothro follows:]

EPA's request to OBM for FY 1992 Section 319 funds was $25 million; and, the President's FY 1992 Budget also requested $25 million for Section 319.

Mr. BORSKI. Does EPA have the resources to properly implement the section 319 program and achieve an improvement in water quality?

Ms. PROTHRO. I think we have the resources currently to do a minimally acceptable job in implementing the 319 program. We have made a request recently to the Office of Management and Budget to allow us to hire additional personnel with some funds that were set aside from the State grant funds under section 319(n), and we've had some difficulty using those funds for EPA personnel because they happen to have been appropriated in the Abatement and Control account rather than the Salaries and Expenses account. So we need some special authorization in order to use that money for hiring new people, and we're working on that. We've asked for about 30 new people to help us carry out the program.

Mr. BORSKI. Do you need legislative help in this regard? It's my understanding that in 319(n) Congress has authorized a set aside for administrative costs as much as 5 percent.

Ms. PROTHRO. That's right.

Mr. BORSKI. Do you need that——

Ms. PROTHRO. We have not yet received an answer from the Office of Management and Budget as to whether there's a way we can use it without legislative change. We'll have to let you know after we get an answer from them.

Mr. BORSKI. Thank you very much. How many staff years or FTEs are allocated for EPA's Nonpoint Source Control Program in the Washington headquarters?

Ms. PROTHRO. In headquarters—now, let me point out again that these are the ones that are specifically identified for the 319 program as opposed to the more general nonpoint source efforts that are included in many of our programs. For the fiscal year 1991, we currently have 15 people in our budget for EPA headquarters.

Mr. BORSKI. How about the regions?

Ms. PROTHRO. In the regions, we have 36.4 people.

Mr. BORSKI. Can you tell me how many staff years or FTEs are devoted to EPA's Point Source Control Program in Washington and in the regions?

Ms. PROTHRO. No, I don't have that with me, but we don't quarrel with GAO's estimate that the total resources devoted to point sources are about 94 percent of the overall control programs in the water area.

Ms. BORSKI. Could you submit that data for the record, also?

Ms. PROTHRO. Yes.

[The information received from Ms. Prothro follows:]

Currently, we estimate that the Office of Water is devoting about 220 staff years in Washington and 940 staff years in the Regions to point source control programs. I would note that these point source control programs include EPA efforts on separate storm sewers and combined sewer overflows, which are sometimes considered "nonpoint" sources even though they are point sources under the NPDES permit program.

Mr. BORSKI. Has the EPA office that administers the Nonpoint Source Control Program filed a Declaration of Vulnerability under the Federal Managers Financial Integrity Act?

Ms. PROTHRO. Yes.

Mr. BORSKI. Could you also submit a copy of that to the committee for the record?

Ms. PROTHRO. Yes.

[The information received from Ms. Prothro follows:]

On October 25, 1990, I filed the annual report for 1990 on Internal Controls for the Office of Water Regulations and Standards (OWRS).[1] This report indicated that OWRS had established a grants review process and tracking system to address potential vulnerabilities with Section 319 grants. (Funds for Section 319 grants were first appropriated in FY 1990; as a new grant program, OWRS identified the need to have appropriate controls in place to manage and track these new grants to States.)

In the fall of 1990, several new responsibilities were assigned to OWRS as a result of Congressional authorizations and appropriations and a court decision. Given that these new responsibilities had not been budgeted, I requested on November 7, 1991, that the OWRS Division Directors identify any new vulnerabilities in their programs. While this request was not intended to result in a formal Federal Managers Financial Integrity Act filing, I did want to identify potential vulnerabilities that we would need to address.

In a December 21, 1991, memo to me, Geoffrey H. Grubbs identified the new EPA nonpoint source program responsibilities under the 1990 amendments to the Coastal Zone Management Act as a vulnerability. Given the tight deadlines and extensive substantive requirements for developing NPS management measures guidance coupled with no new resources, it was necessary to reassign existing NPS staff to this activity. This reprogramming further exacerbated the potential vulnerability with administering Section 319 grants identified in the OWRS 1990 Report on Internal Controls.

Mr. BORSKI. Mr. Packard.

Mr. PACKARD. Thank you.

Thank you, Ms. Prothro. In your judgment, is it true that agriculture is the largest contributor to the problem?

Ms. PROTHRO. The reports that we have from our States talk about the number of lake acres, the number of stream miles, that sort of thing, that are impaired, and they identify causes. Now, some of these are estimates, some of the reports are more detailed than others, but they have consistently told us over the last several years that agriculture is the leading nonpoint source and that nonpoint sources indeed are the leading cause of remaining water quality impairments.

Mr. PACKARD. Who can best monitor that and police the problem, then, as requirements are imposed on agriculture? EPA or the Department of Agriculture? Where should that responsibility lie?

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[1] OWRS was responsible for administering the nonpoint source control program at the time of the last required annual report on Internal Controls. As part of the Office of Water reorganization in April 1991, the Office of Wetlands, Oceans, and Watersheds is now responsible for the nonpoint source control program.

Ms. PROTHRO. Currently, the responsibility for the Water Quality Monitoring Program nationally is primarily with the United States Geological Survey. They provide support to the States. The States have the primary responsibility under the Clean Water Act to report to EPA, and EPA provides guidance to the States on monitoring techniques. In general, I think this is a good arrangement that there are Federal resources available to support the States. It is appropriate for the States to have the lead responsibility for monitoring.

I think there are some things we can do to improve this, and we would like to see the Department of Agriculture do some more things in monitoring to evaluate the effectiveness of best management measures for nonpoint sources, that sort of thing. I believe they're starting to move in that area, particularly in the area of protecting ground-water resources.

Mr. PACKARD. Do you think that EPA has an interest or will be making an effort to transfer some of their resources from point to nonpoint, or do you believe that the existing formula that has been testified to will continue in the future?

Ms. PROTHRO. Well, we're making very gradual small shifts toward the nonpoint source area. I don't think it's going to be possible to abandon our Point Source Program. One of my predecessors in this job used to say "Sewage never sleeps." We have to maintain our commitment to the publicly owned treatment works. We also have to maintain our enforcement and oversight programs for industrial dischargers. So I don't see that there are large opportunities by simply shifting from the Point Source Program into the Nonpoint Source Program to significantly increase our efforts.

Mr. PACKARD. What would you like to see Congress do to assist in the problem?

Ms. PROTHRO. Well, I think that one thing Congress might want to think about doing is looking at the relative statutory mandates in the two programs. One of the difficulties the Nonpoint Source Program has is that it can't compete very well for resources when it's largely a discretionary program. If in Congress' judgment we should continue to increase and to move in the direction we are toward nonpoint sources, we may want to look at what specifically Congress would like to see EPA do and have that reflected in the statute.

Mr. PACKARD. Thank you very much.

Mr. BORSKI. The gentleman from Florida, Mr. Peterson?

Mr. PETERSON. Thank you, Mr. Chairman.

I guess I'm a little puzzled here yet. It seems to me that GAO suggested maybe you didn't have enough money to do what you had to do under 319, and maybe you're suggesting that you do have enough funding and it's just maybe not in the right place?

Ms. PROTHRO. No, I wouldn't quarrel that our staffing for the Nonpoint Source Program needs to be built up, and as I say, we have made a request to the Office of Management and Budget to allow us to hire additional staff with the set asides under 319 that are available. We do think that there is an important philosophical issue here that needs to be resolved as to what EPA's role in the Nonpoint Source Program should be.

There's a respectable argument that we do have adequate resources because this is not a Federal problem. I think most of us at EPA—certainly I, personally—believe that the EPA can provide some worthwhile leadership in this area, particularly with our sister Federal agencies and in the area of developing science and monitoring techniques for the States and localities to use. But there is a very legitimate point of view that perhaps these things should be left to State and local governments and to the other Federal agencies that have responsibility for land management. So that's essentially the debate here.

Mr. PETERSON. Okay. Well, that takes me to my next question. In your leadership role to the States, what in fact are the States looking to you for from the leadership standpoint? What kind of programs or statistical data? What is it that they're going to look to you for, and what can you provide them in that leadership role?

Ms. PROTHRO. I think one of the things I hear most often from States in the nonpoint source arena is that they need our help in dealing with other Federal agencies. Much of our land is in the hands of Federal land managers, and some of this is very valuable land that includes some important water quality resources. So they'd like for us to work with the other Federal agencies more to educate people about the nonpoint source problem and the techniques that can be used to solve those problems. But beyond that, I think what they'd like to have from us is financial support for some of their efforts to build programs that are in their infancy right now, as well as science and monitoring techniques to assist them in evaluating nonpoint sources and developing appropriate controls.

We also try to provide a service in technology transfer so that when States develop good solutions to problems, that information can be communicated to other States, and they can adopt the same practices. I think most States would like to see us do a lot more of that, because it's difficult for them to exchange that type of information on a one-to-one basis.

Mr. PETERSON. On a technical note, since the agriculture issue is so looming in nonpoint source pollution, have you targeted any specific pesticides, herbicides, et cetera? What specifically is it that we're going to have to address in that area to curb this?

Ms. PROTHRO. The Nonpoint Source Program hasn't targeted specific pesticides or the sort of chemicals we're going after. We do have some information from a study we did recently on bioaccumulation of toxic substances in fish, and it indicates that some agricultural pesticides are showing up in fish and are of some concern. We're looking at that data now to decide whether or not there are some special things that we ought to do in that regard, and we're working with our Office of Pesticides and Toxic Substances on this.

Mr. PETERSON. Thank you.

Thank you, Mr. Chairman.

Mr. BORSKI. The gentlewoman from New York, Ms. Molinari?

Ms. MOLINARI. Thank you, Mr. Chairman.

I have a difficult time in shifting concerns or monies from point sources to nonpoint sources, specifically because—and I guess we're just beating a dead horse here—when we talk about land management issues, my mind immediately goes to New York City, where

we have a great stake in the management of land in upstate New York around the Croatan Reservoir and several other areas where we get our drinking water. Yet when New York City or EPA comes in and tries to dictate to the State how they should manage that reservoir, there is immediately "No, I'm sorry, this is none of your business. This is our land," even though we buy the water.

So if we in Congress are ready to appropriate additional monies for nonpoint source management, should we not, in reauthorizing the Clean Water Act, grant larger status to EPA in stepping in in those areas where we have a border conflict, if you will, or an interest conflict? Could you comment on that?

Ms. PROTHRO. Well, I think that what EPA can do most to help is to provide educational materials and tools that these local people can use to evaluate whether or not there really is a threat to water quality. I think a lot of times just convincing people that it's a real problem is the main difficulty that we have. I'm not sure that EPA would ever have the capacity to step in and really do the land management or get into land use planning on a local business.

Ms. MOLINARI. And I agree with that. Part of it is education. Clearly, in some instances, it's the economics of the region that has the reservoir versus the interests of a water purification system in New York City, for example, when we think that it would be in our best cost-benefit not to do that. I understand EPA's lack of control in that area, and I guess I'm just citing that as an example as to why I agree with your initial statement that perhaps it is better dollars spent in point sources as opposed to nonpoint sources because we cannot dictate in so many instances those land management decisions that would be realized in terms of clean water.

Ms. PROTHRO. Well, I certainly would agree that the majority of our resources will need to continue to go to point sources over the long term, but, again, there are some things that we can do to help in these other areas that we're not able to do right now.

Ms. MOLINARI. Thank you.

Ms. DELAURO [assuming Chair]. Good morning, Ms. Prothro. I'm Congresswoman DeLauro from Connecticut, and I'm happy to take the Chair for my colleague, Mr. Borski. I'm sorry not to be here for your entire testimony.

I would like to recognize Mr. Hobson from Ohio.

Mr. HOBSON. Thank you.

This is going to be a little different. How long have you been with the agency?

Ms. PROTHRO. Eighteen years.

Mr. HOBSON. That's good, because that will come along with the rest of my question. You were sitting in the audience when you heard the gentleman from Oklahoma's comment about EPA. I've been in the State legislature for eight years, and I live in a predominantly rural but kind of emerging urban area. When we talk about funding, it seems to me that you could do a lot more with what you have if there wasn't so much resistance from the local community. It seems to me when EPA shows up there's an immediate resistance, whether it be the State, the Feds—I don't want to say especially the Feds, but maybe that's true—and that seems to cause a lot of waste of energy and waste of money as we go through this process. Has your department ever looked at this?

I see a lot of fright in the farm community and agriculture community, especially as we come into this next reauthorization, as to what's going to happen to them, and it seems to me that this fear that's built up is costing us a lot of money. We talked about shifting things around. Has the agency ever looked at itself and said, "Is this just a natural course of government, or why do we seem to be the ones, other than the IRS"—I think sometimes they have more of a fear of you than they do the IRS. Why is that? Have you done any self-analysis as to why that happens and how much it costs?

Ms. PROTHRO. Yes, we've talked about it quite a lot internally and are concerned about it. I have to say that my experience is that it varies from community to community. Some communities do actually welcome us in and see our efforts as being supportive of what they'd like to do locally.

Mr. HOBSON. If you have money with you, they usually do.

Ms. PROTHRO. Yes, that's often the case. But I do understand the fear that the agricultural community has, and we've heard that and appreciate it. I think EPA's charge from its statutory mandates has been to develop regulatory programs and to enforce them, and we have a very vigorous enforcement program, and that's the reputation that we have. People don't want to be regulated by EPA, I think, because they know that there is a strong enforcement power behind the agency.

But in the area of agriculture, we have not sought authority to regulate agriculture directly. Some State programs are beginning to do a little bit of regulation, but it's very different from the kind of regulation that's been done in EPA's traditional point source programs. It's not pervasive permitting and strict guidelines on exactly what practices have to be carried out. It tends to be more targeted to severe water quality problems, allowing for a mixture of regulatory and non-regulatory approaches.

That's one of the reasons that we don't think the EPA really is the right level of government to actually implement the Nonpoint Source Program. We think that it is a State responsibility. But we do see ourselves as being able to provide some advice and assistance in this regard and helping to make the States' efforts more efficient by facilitating the sharing of information and that sort of thing.

Mr. HOBSON. Thank you, Madam Chairman.

Ms. DELAURO. Thank you.

The Chair recognizes Mr. Emerson from Missouri.

Mr. EMERSON. Thank you, Madam Chairman.

The GAO report says that agriculture accounts for the largest share of the Nation's nonpoint source pollution, affecting about 50 to 70 percent of the assessed waters evaluated for water quality. Did the GAO get that information from your agency?

Ms. PROTHRO. I believe they took that information from our section 305(b) report, which is based entirely on State data submittals to the agency.

Mr. EMERSON. I wouldn't expect you to be able to give us here today the methodology used to gauge that statement, but I would like to know it and hope that you may be able to submit it for the record. I'm curious as to, in measuring water quality, how you

would measure agricultural runoff as opposed to suburban runoff. I mean, you know, if these kind of allegations are going to be made, I would want them substantiated.

Ms. PROTHRO. I think the picture is more complicated than a simple statistic like that might suggest. For example, while we say that of the impaired waters, 50 to 70 percent of them are affected by agriculture, those same waters may also be affected by some other nonpoint source and by some point sources.

Mr. EMERSON. Do you throw suburban lawns in with farm lands in your——

Ms. PROTHRO. The States do a good job in some areas, and maybe in other areas where this isn't a priority they don't do such a good job in their reports, so sometimes it's a little difficult to tease out this information in the detail we'd like. But there is separate reporting for urban runoff, which tends to include suburban lawns, fertilizer and pesticide uses, so we do have some accounting of that, but it's very rough, and I would agree with GAO's characterization of it. These are estimates.

Mr. EMERSON. So you would say the information really isn't very good?

Ms. PROTHRO. I'd say it varies. It's the best we have.

Mr. EMERSON. Vast conclusions are being drawn from very limited data.

Ms. PROTHRO. I think that's true. I don't think the data is so much limited as it is not terribly specific. We have a lot of data in our program on what the water quality problems are and where they are, but not a lot of information on exactly where those problems are coming from.

Mr. EMERSON. Has your agency done anything to measure the impact on water quality of the highly successful Conservation Reserve Program that was implemented through the 1985 Farm Bill, designed to take out of production and has now achieved a level, I think, of 37 million acres in the United States? Have you assessed the impact of that?

Ms. PROTHRO. We do not have a water quality monitoring program specifically for the Conservation Reserve Program. We're trying to get more of that done. We'd like to see the Department of Agriculture do a little more of that, too. We do think it has had a very beneficial effect on water quality in those areas where its focus has been water quality protection. Much of the focus of that program has been on soil conservation. Although they're often compatible, sometimes areas that you might protect for soil erosion are not the same as those you might protect for water quality protection. So I wouldn't say that the entire program goes to water quality protection, but it's been helpful in some areas.

Mr. EMERSON. I would have to think there would be enormous fallout, because basically what we've done is taken 37 million acres of land out of production, put it into trees and natural grasses that don't require a lot of fertilizer, and, you know, I don't know how the GAO can come to the conclusions they do without taking things like that into account.

The bottom line in this report really, read in its entirety, is that there's an awful lot the EPA doesn't know, and in order for them to know more than they currently know, they're going to need a lot

more money. I don't know if we ought to make that investment in giving you all a lot more money until we see some data that indicates, by which we can measure systematically, the progress of what it is you're trying to control.

I mean, here is one of the largest, very costly farm programs designed to take up to 50 million acres out of production. We're now at 37 million acres, and no one has accounted for it in this GAO report. The EPA and GAO are blasting agriculture, but nobody can tell us the impact of one of the farm programs of the greatest magnitude ever conceived, vis-a-vis the environment. I mean, that is an environmental program, the CRP, and it gets scant attention. I think that your agency and the General Accounting Office both should look to that program and find the means of measuring its environmental impact. I think you'd find it's been enormous.

Ms. PROTHRO. We are working with the Department of Agriculture in trying to find better ways to evaluate the success of the agricultural programs that are directed to water quality, and I hope we'll have some better information for you on that.

Mr. EMERSON. Do you have a close liaison with the Agriculture Department in taking a look at conservation programs that have been implemented under previous farm laws and are currently being implemented under the 1990 Farm Bill?

Ms. PROTHRO. I would say yes, we have a close relationship. It's difficult sometimes to even keep up with all the committee meetings. We're not able to cover some of them there are so many, but we do have an Personnel Exchange Program, and we do have a committee structure in which EPA actively participates that works with the Department of Agriculture on its water quality efforts. So we think that the relationship has been strengthened substantially in the last two to three years especially.

Mr. EMERSON. I think there needs to be a much closer liaison by the EPA with agriculture and a much better understanding by the EPA of what agricultural environmental and conservation programs are designed to achieve. I very distinctly get the impression that your agency has an elitist point of view and that it's only the EPA that knows what's good for the environment, and you tend to look at the Agriculture Department as a bunch of farmers sitting over there who don't know what they're doing, and I'll guarantee you that farmers perceive of the EPA that way. I think it's a problem that you, together with the Department of Agriculture, need to work on.

Ms. PROTHRO. Well, I appreciate that, Mr. Emerson. I don't think that we do have an elitist view. As a matter of fact, my boss, LaJuana Wilcher, started her government career at the Department of Agriculture, and we have very close ties there. I think we have a good appreciation for some of the problems, and I think that appreciation continues to grow as we work together on these committees and through our personnel exchange programs.

Mr. EMERSON. You talk about personnel exchange programs and interagency review committees and what have you. What about emphasis on the understanding of the public at large of the role of your agency in relation to them and the impact upon their lives and their livelihood? Sometimes I get the idea listening to the EPA testifying that, you know, this agency exists for the purpose of

interagency review committees and exchange programs with other departments and agencies to learn what other departments and agencies are doing. Of course, all that's important, but ultimately it's the impact on the public and the livelihood of people out there trying to make ends meet that is at stake in the pursuits of your agency, and I think maybe a little more attention should be given to that.

That's a statement. You may respond to it if you wish.

Ms. PROTHRO. Well, one thing I would point out is that the Personnel Exchange Program is more than just our folks going out to learn what other agencies are doing. In fact, we're not able to do much of that at all. In fact, most of the personnel exchanges have been from the Department of Agriculture into EPA, and I'd say probably about half of our nonpoint source staff now actually working in our regional offices are actually Department of Agriculture employees who are working on detail to EPA.

Ms. DELAURO. Ms. Prothro, let me ask you two or three questions, if I can.

In taking a look at the EPA water quality reports that were issued in 1986 and 1988, it appears as if there has been a decrease in the impact of agricultural runoff, the impact that it's had on the water quality in lakes. Can you focus on this for a second and explain the decrease?

Ms. PROTHRO. We don't see it as a decrease. There have been some changes in the way data were presented in 1986 as compared to 1988, and in fact this same issue came up at a hearing last week at which I testified before the Water Resources Subcommittee, so we're developing a more precise answer to it. But I think the thing to keep in mind is that in 1986 we identified nonpoint sources as an entire category and tried to estimate their contribution, and in 1988 we broke nonpoint sources out into various categories, including agriculture and others. So partly for that reason, it's comparing apples and oranges.

Also, it should be noted that there were different lake acres assessed in 1986 as compared to 1988, so there's no direct correlation. It may suggest certain things, but there's no direct correlation. So a change of a few percentage points would not necessarily represent an improvement in water quality.

Now, I want to add to this that that doesn't mean there wasn't an improvement in water quality, either, because there may indeed have been in some areas, and I have no doubt that through some of the agriculture programs there have been some improvements. But I think the data, including the data that's coming in from the States now for our 1990 report, continue to show that of the streams that are not meeting water quality standards, the States feel that the primary contribution is nonpoint sources, that that continues to be true, and of the nonpoint sources, agriculture continues to be the major contributor.

I might add that within the agricultural sector, animal waste is probably the major problem. We've talked quite a bit today about pesticides and fertilizers, but actually the management of the animal waste, grazing in streams, and that sort of thing is very important here.

Ms. DELAURO. Let me just ask about the pesticides and the water quality reports that look at pesticides as not contributing substantially to water quality problems. The pesticides that you just mentioned, and maybe in terms of agricultural runoff, what kind of an environmental problem and human health problems do those cause?

Ms. PROTHRO. Well, the best information that we have on surface water exposures from pesticides is our National Bioaccumulation Study, where we did find that pesticides were showing up in fish that people might be eating, but so far the levels at which those pesticides are showing up doesn't seem to be a level of significant concern. We also have another survey on pesticides in ground water, which I can provide to you, that shows that there are some areas where pesticides in ground water are also showing up at levels that we might begin to be concerned about. We can provide more information to you on that.

Ms. DELAURO. Yes, please, if you would. That would be great.

[The information received from Ms. Prothro follows:]

The National Bioaccumulation Study and National Survey of Pesticides in Drinking Water Wells provide the most current information on the potential environmental and human health problems from pesticides.

The National Bioaccumulation Study is a one-time screening investigation to determine the prevalence and sources of selected bioaccumulative pollutants in fish. Fish samples were collected at 388 sites nationwide and analyzed for 60 pollutants, including dioxin and furan compounds, pesticides/herbicides, mercury, PCBs, and other organic compounds. Of the compounds other than dioxins and furans, the most frequently detected pollutant was DDE, detected at over 98% of all sites sampled. This compound is a metabolic breakdown product of the pesticide DDT, which was a widely used pesticide that is extremely persistent in the environment. Other pesticides detected and the percent of sites at which they were detected include the following: nonachlor trans (77%), chlordane-cis (64%), dieldrin (60%), and mirex (35%).

Seven of the 15 dioxin/furan compounds and 15 of the other 45 compounds were detected at over 50 percent of the sites. Of the 60 chemicals, only PCBs, TEC, and dieldrin indicated cancer risks equal to or greater than one in ten thousand. Estimated upper-bound risks were highest for PCBs which may be high enough at 49 sites to pose an increased lifetime cancer risk greater than one in ten thousand. The estimated risks for dieldrin exceeded one in ten thousand at 8 sites.

The National Survey of Pesticides in Drinking Water Wells was a five-year survey to evaluate the presence of pesticides, pesticide degradates, and nitrate in wells nationwide. Based on the survey, EPA estimates that about 10.4% of the 94,600 community water wells and 4.2% of the 10.5 million rural domestic wells contain one or more pesticides. The most frequently detected pesticides were DCPA acid metabolites and atrazine.

Based on the survey, EPA estimates that less than one percent (0.6%) of rural domestic wells containing pesticides contain at least one pesticide over a Maximum Contaminant Level (MCL) or Lifetime Health Advisory Level (HAL). For community water systems, EPA estimates that less than 1% (0.8%) contain pesticides at concentrations higher than the MCL or HAL. These results indicate that the proportion of wells nationwide containing any one pesticide or degradate is low. However, substantial numbers of wells could be affected.

Ms. DELAURO. Let me just ask another question. Under the Clean Water Act, in terms of the funding that's available through the State revolving funds, it's mandated that the money be used first for wastewater treatment before it can be used for nonpoint source pollution or for implementing the management plans in the estuary program. Let me ask you if you agree with this first use requirement for wastewater treatment. Maybe we shouldn't be mandating or demanding that we come up to the secondary treat-

ment level before permitting the money to be used for nonpoint source pollution.

Ms. PROTHRO. It's a very difficult question. I think there are legitimate reasons why we have to maintain our commitment to wastewater treatment. There are some cases where in a certain locality it may be more effective, though, to control some nonpoint sources of pollution rather than to move on to a tertiary treatment or the more expensive kind of treatment for municipal treatment. There has been some experimenting going on with this in some areas of the country. In North Carolina, in particular, there is an effort to look at sort of trading between controls for point sources and nonpoint sources, but this is rather limited in its applicability.

I think it's true where nutrients are a problem and where there are nonpoint sources that are contributing to the same nutrient problem that the sewage treatment plant might have been contributing to. In general, though, I don't think that we know enough yet to be able to say that it's better to mandate only sewage treatment first.

We may want to take another look at that in the Clean Water Act reauthorization process and allow more flexibility. I think most States are finding it very difficult, even when they have some ability to move into the nonpoint source arena, for their State revolving funds to do that because of the needs of the cities for wastewater treatment.

Ms. DELAURO. Well, it's becoming one of the problems with Long Island Sound. Commissioner Appleton last week in his testimony said that if we did all the cleaning up of the nutrients in the sand that we would be back in the same situation in the next two years if we didn't address the nonpoint sources, of pollution.

Let me just ask one more question. You mentioned North Carolina, and you also mentioned that it was more of a State mandate to deal with the nonpoint sources. Are there States that are, in your view, adequately dealing with the nonpoint source difficulty? Are they able to both identify and control the problem? Are there examples of that around the country?

Ms. PROTHRO. I think most States are struggling in the same way EPA is, that their water quality agencies are committed to a strong point source program, and they're beginning to move in the direction of increasing their efforts for nonpoint sources. So State programs are at various stages of development, depending in part on how far they've gone in solving their point source problems.

I think the State that comes to mind as being particularly outstanding is the State of Wisconsin, where there is a very strong nonpoint source program. We've awarded a number of States some special grant funds in recognition of their leadership in the nonpoint source area, and we have some information on those programs that we could send you. I think there are many programs that have very strong aspects. There are few States that have been able to develop truly comprehensive nonpoint source programs that address all of their problems adequately, and I suspect the States would agree with that. It's something we're continuing to struggle with.

Ms. DELAURO. The information would be helpful.

[The information received from Ms. Prothro follows:]

There are a number of States that are making substantial progress in identifying and controlling their nonpoint source pollution problems. However, even the States with the best nonpoint source control programs have shortcomings which they recognize. Thus some of the most successful States are working hard at improving their nonregulatory and/or regulatory approaches to control nonpoint source pollution.

Some examples of good State programs can be cited. Four States were identified by EPA in 1990, the first year of Federally-funded implementation of nonpoint source programs under Section 319, as national leaders in nonpoint source control. These States were Idaho, Minnesota, North Carolina, and Virginia. Eight others were identified as also being among the national leaders: Arizona, Kentucky, Michigan, Montana, Rhode Island, South Dakota, Washington, and Wisconsin. These States and others use such techniques as financial assistance for the implementation of BMPs' technical assistance and requirements for nutrient management (e.g., Virginia and Maryland); requirements of compliance with State anti-degradation laws (Idaho); and point source-nonpoint source trading (North Carolina). Other successful or promising approaches include stormwater runoff and sediment and erosion controls (e.g., Maryland and Delaware), and regulation of "bad actors" (Wisconsin).

EPA continues to identify and publicize (through a publication entitled "Nonpoint Source News Notes," an electronic bulletin board, and other means) the most successful and promising approaches currently being used by States.

Ms. DELAURO. I promise you this is the final question, which has to do with the States. In the testimony of Mr. Bauer from Idaho, he mentions that in terms of the funding for nonpoint source pollution that one of the problems is the inadequacy of the funding, but it's also a question of reliability. Idaho received, I guess, in fiscal year 1990 about $790,000, and the following year the State received about $500,000. So there is no ability to really calculate what you're going to receive in terms of being able to carry out the program that you may have outlined and designed. How can States, if it's your view that they ought to be taking on the responsibility of addressing nonpoint source pollution, put together programs and be able to carry them out, given the unreliability of funding?

Ms. PROTHRO. Well, I think the reliability of funding will improve as we get more experienced with this program. That's part of the answer. I think the other part of the answer is that States will need to develop their own funding sources for their nonpoint source activities as well, that it's not likely that the Federal Government is going to be able to pick up the lion's share of nonpoint source funding for the States.

I would point out that fiscal year 1990 was the first year of funding under section 319, and we received the authorization for that funding rather late to get started on distributing it to the States, but we had an interim allocation formula that we used in the first year, and the States were told that we were going to have to refine that further and get public comment on it, that sort of thing, for 1991, which we did. But we have asked our regional offices to make some judgments about the quality of the programs, their ability to really address nonpoint source problems in their States, and actually awarding those funds under section 319.

By the way, I have to say that I believe Idaho is one of the programs that we have recognized as being an outstanding program, so it's certainly no reflection on the quality of Idaho's program.

Ms. DELAURO. I thank you for your candor. When I think about States trying to pick up some of these costs—I hate to be parochial, but I come from the State of Connecticut, which at this moment has a $7 billion budget and a $2.4 billion deficit. It's hardly likely

that they're going to move into that direction, because they're struggling with maintaining basic services. So somewhere we have to address the problem. I think shifting the burden onto the States at the moment is the wrong direction, if I may say so.

That concludes my questions.

Are there any others?

Mr. EMERSON. Madam Chairman, could I ask another question?

Ms. DELAURO. Yes.

Mr. EMERSON. Do you advocate no use of agricultural chemicals?

Ms. PROTHRO. No, that's not our position.

Mr. EMERSON. You mentioned that some fish have been tested and some pesticides have been found in the fish. You indicate that you don't know if they had any harmful effects. What effect did it have on the fish?

Ms. PROTHRO. Well, we're looking at, through our risk assessment methodologies, whether or not these are approaching levels of concern for human health, assuming that people are consuming these fish. Of course, we'd like not to find pesticides in fish, but it's not necessarily a matter of alarm until you look at the levels and look at the exposures.

Mr. EMERSON. Of course, there are very, very extensive laws on the books already governing the use of agricultural chemicals and contemplating the impact that they may have upon human consumption. Do you take all that into account?

Ms. PROTHRO. Yes, I agree. This is the information that we are supplying to our Office of Pesticides Programs so that they can consider it in their actions on pesticides. Some of the pesticides we're finding in fish, by the way, are pesticides that have already been canceled, so it could be residual problems from years past, pesticides that may have accumulated in sediments, that sort of thing.

Mr. EMERSON. Does your agency concern itself with and have knowledge of the intent of FIFRA?

Ms. PROTHRO. Yes.

Mr. EMERSON. I think one thing we're trying to avoid here is, you know, the Delaney clause of much discussion over the years was implemented to make chemicals, food additives, and what have you safe for human consumption, and later we found through scientific evidence that it was greatly overdone. We regulated to the point that, yes, the addition of certain additives in certain food stuffs would cause cancer in mice, but that a mouse would have to drink 250 12-ounce cans of Coke a day in order to get cancer. Well, that's overregulation, and I think that's one thing we want to avoid in any legislation that we may contemplate as a result of this GAO report or in pursuit of the Clean Water Act.

I think we've got to maintain some common sense level, and I want to remind everyone just for emphasis that the American consumer has available to it the widest array of food stuffs available to any consuming public in the world at the lowest prices of any consuming public in the world, and I don't know that we really want to tinker too much with that system. So I want us to keep that fact in mind as this committee and other committees pursue their goals and GAO and EPA recommendations.

Thank you, Madam Chairman.

Ms. DELAURO. Thank you. My promise of one last question was unfounded. I have one more question as to why the EPA hasn't established national pollutant criteria and effluent limitations for nonpoint sources in the same way they have done for the point sources?

Ms. PROTHRO. Well, let me take those separately. For effluent limitations, we have very specific mandates in the Point Source Program to establish effluent limitations guidelines that are enforceable regulations for various industrial dischargers. We don't have that same mandate under the Clean Water Act for nonpoint sources. We do have a mandate under the Coastal Zone Management reauthorization to develop guidelines for States then to pick up in their programs not necessarily as regulatory mechanisms, but to include in their nonpoint source management programs in the coastal areas, and we're working hard on that process, so we will have a proposal soon on that.

Ms. DELAURO. When will that proposal be completed?

Ms. PROTHRO. I think the statutory deadline is something like the beginning of next week or the end of next week and we probably will miss that, but we will have a draft ready very soon, and it's almost ready to go through final agency review now, so we won't miss it by much. Then the statute mandates final promulgation a year from now, I think in May of 1992.

Now, again, we don't think it's appropriate to have quite the same kind of direct regulatory provisions for nonpoint sources as we have had for point sources, so this is a rather different approach.

In the area of criteria, our criteria are neutral as to whether they apply to point sources or nonpoint sources. Theoretically, our chemical criteria could be used for both. The difficulty is that some of the pollutants that are primarily nonpoint source-related are not covered by the criteria documents we have issued so far. Most of our criteria documents relate to toxic pollutants rather than to nutrients and siltation and that sort of thing. So we are trying to increase our focus on nonpoint source-related criteria.

We think one of the best ways to do this is to use biological criteria; in other words, to set some standards for what would be a healthy biological community in a stream. A lot of this has to be done on a stream-specific basis or a region-specific basis but with Federal guidance and support, and we have asked States to adopt general narrative criteria for biological integrity for their streams by 1993 and then eventually some specific criteria that they could use to measure biological integrity thereafter. So we're moving on this. We certainly agree that that's a necessary thing to help us with our nonpoint source efforts.

Ms. DELAURO. Indeed. Thank you very, very much, Ms. Prothro. I appreciate your time and your testimony.

[Ms. Prothro's prepared statement appears on page 106.]

Ms. DELAURO. We're pleased this morning to have testifying for the last panel Mr. Edward Neafsey, Director of Enforcement Policy, New Jersey Department of Environmental Protection; Mr. Robert Zimmerman, Environmental Program Administrator, Delaware Department of Natural Resources and Environmental Control; Mr. John Hughes, Director, Division of Soil and Water Conser-

vation, Delaware Department of Natural Resources and Environmental Control; and Mr. Steve Bauer, Acting Manager, Surface Water Section of the Division of Environmental Quality of the Idaho Department of Health and Welfare.

Would you mind standing, gentlemen, and raise your right hand?

[Witnesses sworn.]

Ms. DELAURO. Mr. Neafsey, can we ask you to kick off the panel?

Mr. NEAFSEY. Yes. Thank you, Madame Chair.

TESTIMONY OF EDWARD NEAFSEY, DIRECTOR OF ENFORCEMENT POLICY, NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION; ROBERT ZIMMERMAN, ENVIRONMENTAL PROGRAM ADMINISTRATOR, DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL; JOHN HUGHES, DIRECTOR, DIVISION OF SOIL AND WATER CONSERVATION, DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL; AND STEVE BAUER, ACTING MANAGER, SURFACE WATER SECTION OF THE DIVISION OF ENVIRONMENTAL QUALITY, IDAHO DEPARTMENT OF HEALTH AND WELFARE

Mr. NEAFSEY. Good morning.

Thank you for providing New Jersey an opportunity to testify before this subcommittee and give you our perspective on nonpoint source pollution. I'd like to begin by briefly discussing the significance of this issue in our State, and then I'd like to let you know some of the things we're doing to try to address the problem.

Nonpoint source pollution is a major contributor to our failure to achieve fishable and swimmable clean water goals in 70 percent of our assessed streams and rivers and 24 percent of our estuaries. In addition, weekly monitoring of swimming beaches during the summer season reveals that nonpoint source pollution has been the cause of more than 70 percent of all beach closings in New Jersey. Clearly, nonpoint source pollution threatens the water resources of the State, as well as our tourist economy and our way of life.

As the most densely populated State in the Nation, New Jersey must focus on urban and suburban nonpoint sources, yet we find that there has been limited Federal assistance for problem assessment in these areas. Nevertheless, New Jersey, through many State-funded programs, is committed to the goal of controlling nonpoint source pollution. At the present time, State funding for these programs exceeds Federal contributions. However, even with the State contribution, the total funds are inadequate to provide nonpoint source pollution implementation at the level called for under the Clean Water Act.

If I can, I'll go through some of our efforts. Under the New Jersey Sewage Infrastructure Improvement Act, the State has made available $1.5 million thus far and will provide $5.5 million more this year to address stormwater discharges within our four coastal counties. In addition, approximately $7 million has been appropriated to address combined sewer overflows on a Statewide basis. The primary intent of this law is to protect coastal water quality by removing bacteria from stormwater systems, as well as abating nonpoint sources of pollution. An additional $2 million was

appropriated under this act, and it was utilized to fund Operation Clean Shores, where we use low-security inmates from our State prison system to remove floatable debris from the shoreline, and last year they removed 9.5 million pounds of that debris.

In 1990, New Jersey also passed the Stormwater and Combined Sewer Overflow Abatement Bond Act, and through this act, $50 million will be made available as grants and loans to local governments for planning, design, and construction of local stormwater and combined sewer overflow projects. Although we think we're on the right track, these appropriations really just begin to scratch the surface of the problems in our State.

In the meantime, New Jersey is trying to fill the present need for implementable solutions. A nonpoint source and stormwater control best management practices manual is being drafted. Also, groundwater protection BMPs have been established. However, through these programs it has become apparent that precise technical information is needed on the performance of present proven technologies and the development of new innovative pollution reduction methods. This is especially true when tackling the problems associated with existing development, which is viewed as the most difficult nonpoint source pollution problem in New Jersey. In this aspect, more technical guidance from the Federal Government would be welcome.

In the area of groundwater protection, New Jersey has seen progress. We have an approved groundwater strategy and have released a wellhead protection plan. New Jersey also has strong programs to address groundwater contamination by underground storage tanks and hazardous wastes.

To protect surface water drinking supplies, the New Jersey State Legislature required the Department to investigate the feasibility of buffer zones surrounding drinking water reservoirs. The Department submitted a report recommending the application of multizone buffers throughout the watersheds associated with water supply reservoirs, intakes, and tributaries, and legislation has been introduced to implement the recommendations in the report.

As New Jersey moves forward in its programs, the need for coordination between agencies and programs of varying authority has become evident. Recently, the EPA promulgated regulations for controlling stormwater discharges. As New Jersey has been developing its programs to satisfy the intent of the Clean Water Act, we have realized that there is a considerable overlap between the activities involved with stormwater permitting and nonpoint source management. It is essential that there be coordination between these activities. This is extremely important for urbanized States like New Jersey, where suburban runoff is the principal concern for both nonpoint source management and stormwater control.

To summarize, Madam Chair, more monitoring, research, and technical development to address urban and suburban sources of nonpoint source pollution is needed. Such information is fundamental to begin the planning and implementation phases of sound programs. Since the adoption of section 319 in the Clean Water Act of 1987, the understanding of nonpoint source pollution and its complexity has slowly broadened. It is evident that control of nonpoint source pollution will take many years, require an educational pro-

gram that will lead to changes in lifestyle and attitudes, and also require demonstrable leadership and intervention by government at all levels—that is, local, State, and Federal.

New Jersey has demonstrated its commitment to improving water quality and reducing nonpoint source pollution. We would ask Congress to reaffirm its commitment through reauthorization of the act and the amendments that will both support and coordinate all State efforts in this regard. Therefore, New Jersey requests that Congress provide a long term and substantial funding base for both nonpoint source pollution and stormwater control so we can achieve the original goals of the Clean Water Act calling for a return of fishable and swimmable waters throughout the country. Thank you.

Ms. DELAURO. Thank you, Mr. Neafsey.

Mr. Zimmerman.

Mr. ZIMMERMAN. Thank you.

I appreciate the opportunity to present our comments today. Delaware is here basically in two parts. I represent the water quality agency within our Department of Natural Resources.

With respect to some unique things about Delaware that I think make us a good example of what the Nonpoint Source Program is about, Delaware is in the top 10 in terms of population density, agricultural land per capita, and wetlands per capita. In terms of trying to balance those problems, I think we've had to come up with and struggle with the nonpoint source problem at the local level.

When viewing the Clean Water Act and its mandate for fishable and swimmable waters, we feel that the nonpoint source is not a discretionary program, but is in light of the mandate put forth in the Clean Water Act. We must recognize that we cannot continue nonpoint source as a demo program. It must be institutionalized and does require a long term commitment. Our experience has been that we're not going to see immediate results in water quality in a two- or three- or four-year period. Our experience shows that we're looking more at a 10-, 15-, and 20-year commitment before we can see results.

What we've seen in Delaware that's essential to make a nonpoint source program work has been teamwork—effective use of all Federal, State, and local programs in making a combination that works at the local level, given the particular watersheds in that particular State. One of the things that would help along that line would be strengthening the Federal consistency provisions in the Clean Water Act so that we make the best use of all the Federal support and programs and technical assistance.

Secondly, it's essential, given the mandate under the Clean Water Act, that some Federal leadership be provided. We would think that EPA might be best positioned to provide some leadership in terms of the Clean Water Act mandate. Finally, monitoring of nonpoint sources is imperative. We have some deficiencies there that we need to work on.

First of all, we need better science, we need better monitoring protocols for dealing with a different beast than we were under point source to try to assess, and we need also to shift our standards slightly so that we recognize the fact that in many cases non-

point sources are a problem that exists as a temporary excursion in water quality. That needs to be recognized, and secondly, we must come up with a management program that provides accountability for whatever funding is made available so that public support will continue. Thank you.

Ms. DELAURO. Thank you.

Mr. Hughes.

Mr. HUGHES. I run the Division of Soil and Water Conservation, which is normally the contact division with the people of Delaware for many of these programs. Delaware was the first State to receive Environmental Protection Agency approval and funding for its 319 Nonpoint Source Program. We have by now had considerable experience in working with the Federal Government in this new, inexact, and unfamiliar area.

Let me state from the beginning that we agree with both the Environmental Protection Agency and General Accounting Office assessments of the importance of the problem. Delaware's high percentage of arable land, absence of any national parks, and low population density over the bulk of its land area make agricultural nonpoint source a major concern. Rapid development around our inland bays threatens our most valuable natural area, and heavy industry in and around Wilmington, combined with suburban sprawl, has given us unenviable parity with larger and more publicized urban and industrial centers.

Our Nonpoint Source Program, briefly delineated in Attachment A, is intended to meet the highest standards of environmental concern from both the Federal Government and our own citizens. To that end, we have devised programs in every area of concern delineated in the General Accounting Office report, each devised by reviewing known existing and successful programs and tailored to Delaware's needs. Attachment B represents our approach to just one area of concern: urban stormwater. Animal waste systems—Attachment C—water quality standards, groundwater protection, freshwater wetlands, agricultural drainage systems, and farming practices from no-till crops to proper disposal of the poultry industry's normal bird mortality have received or are receiving comprehensive attention in Delaware.

In addition, we have funded major, broad-spectrum efforts within critical watersheds. The inland bays recovery initiative addresses 38 recognized environmental problems within a single watershed and tracks and measures each one. Its high visibility and public acceptance have focused attention on nonpoint sources for the first time. Within the initiative, we have designed updated conservation plans which incorporate the full range of environmental concerns applicable to farming. With the Delaware Cooperative Extension Service and Soil Conservation Service help through the delivery systems long ago perfected by the conservation districts, we are able to offer cooperators a site-specific review of their environmental practices, which ensures sustainable, environmentally enlightened agriculture.

We have received and discussed among ourselves the General Accounting Office report to this subcommittee and find in it substantial areas of agreement. We, too, feel that the time has come to consider matching funding to its environmental productivity. We

lament that the current pattern of land use prevalent throughout our State consumes land in great chunks without even perfunctory consideration for our future. If we differ, it is with regard to a stated impatience with progress so far. We remind you that we are only now entering into the third budget cycle in a new, totally different, non-traditional program which breaks sharply with the Environmental Protection Agency's experience and techniques of the past.

There will be few milestones in the fight against diffuse pollution but many beginnings. Unlike the dedication of a vast new treatment plant, no valves will be turned. Rather, in thousands of locations, improved techniques will have incremental effects on water quality, which will only be appreciated over decades. In taming this different breed of cat, public education must encourage funding, which must precede regulation.

As a case in point, "bad farming" laws are possible only when good farmers call for them. In Delaware, that time will come only after we have enabled our citizens to know what is right and then help them do it. Essentially this is no different from the Federal cost-sharing offered municipalities under the Point Source Program.

I appreciate this opportunity to comment and invite any and all of you to come to Delaware to share our successes and help us with our problems on-site—preferably some fair summer day.

Ms. DELAURO. Thank you for the invitation.

Mr. Bauer.

Mr. BAUER. Thank you.

As cleanup batter, I'll just hit some high points, since you have my written testimony.

One of the things I'd like to point out is that we need to keep a perspective from the western States in the Nonpoint Source Control Program. In Idaho, for example, over 60 percent of our lands are in Federal public ownership, and the pollutants by and large are from forestry, grazing, mining, and road building. The pollutant of concern is sediment, and it's clean sediment rather than toxic sediment. Riparian areas are important to water quality management. If we addressed riparian areas in the western landscape, we feel like we'd address a large portion of our nonpoint source pollution problems.

Another important point to keep track of is the maintenance of high-quality waters. We do have a lot of high-quality waters, and we think that we could get a lot of help if Congress would put some push on maintaining those high-quality waters.

I have eight points that are in my written testimony. The first one is that nonpoint source program development and management is best accomplished at the State and local level. We provided examples of both regulatory and non-regulatory programs in the written testimony, and we think the system works as long as the States are in charge of developing those programs and implementing the programs.

Secondly—and you've heard this already—our message to Congress is to send money and to be consistent. If Congress funded the Nonpoint Source Program at the level that was suggested by Martha Prothro, we feel like it would gut the Nonpoint Source Pro-

gram. It would send a message to the States that nonpoint source programs aren't important, and there simply would be no progress made on this important activity.

Federal consistency provisions in section 319 of the act are inadequate. Basically, what we see, is that the Federal consistency provisions put the burden on the States for program and project review, when what we'd like to see is that the burden is placed for compliance on the Federal agencies. The State's job, then, is essentially quality assurance/quality control.

The fourth point is that EPA should provide greater emphasis at the national level to assure that Federal agency programs compliment rather than conflict with the Clean Water Act. Again, the burden has been placed on the States; however, the programs are set at the national level. We feel like it should be a bottom-up and a top-down approach. EPA should be looking at those Federal programs, USDA programs, Bureau of Land Management, and Forest Service and helping us get that consistency.

We think it's an appropriate Federal role to assist the States in nonpoint source pollution research, criteria development, and development of monitoring methodology. I didn't hear any disagreement with that from Martha Prothro. The States should be in charge of program management implementation. To date there has been a pittance provided from EPA on nonpoint source research. We need more money and more assistance in that endeavor.

In Idaho, we've adopted a program called the Feedback Loop Concept for nonpoint source programs. It's in our water quality standards, and it's in our Nonpoint Source Program. What the system does is to say that you identify the BMPs, develop processes for applying site-specific best management practices, monitor them, and then revise the BMPs. This system has worked for Idaho, and it's developed a process that we think is a model that could be used nationally, and we hope that you take a look at it.

The seventh point is that there should be some kind of backup regulatory program in the Clean Water Act. Currently, there is not a sufficient incentive for States to adopt programs and funding mechanisms for nonpoint source activities. We feel that Congress needs to send a clear message that nonpoint source pollution should be controlled, and the States should get on with the job.

The last point is that Congress provide strong direction on groundwater quality protection to EPA and the States.

I'll conclude my comments with that statement.

Ms. DELAURO. Thank you very, very much, gentlemen.

Let me ask a couple of questions, and then I'll ask the ranking minority member of the committee to follow up. It's a similar question that I asked Ms. Prothro.

Under the Clean Water Act, as you know, the State revolving loan fund has this first-use provision where you must bring wastewater treatment to the secondary treatment level before the funds can be used to deal with nonpoint source pollution. Let me just ask you if you think that that's what we ought to continue to do, if this first-use makes good sense, or should there be more flexibility provided to the State in dealing with this funding? How do you think we ought to try to handle this current situation?

Mr. ZIMMERMAN. If I can, Delaware is in the process of establishing its State revolving fund at the moment. We met, however, our first-use requirement several years ago, so as part of the development of the State revolving fund, we are setting aside a sub-State fund for nonpoint source funding. We believe that the first-use requirement was a good provision in that it recognizes the mandate that came out of the 1972 act, and again reaffirmed in 1977, to put in place secondary treatment. There are adequate provisions, I think, to seek relief from those minimum treatment requirements within the act already for certain locales across the country where maybe that is excessive. I speak specifically of 301 in the act.

So to answer your question, I think the first-use is a good provision, and we're well ahead of that in putting together a program for nonpoint source funding through the State revolving fund.

Ms. DELAURO. Anyone else?

Mr. NEAFSEY. I think that flexibility in that regard would be helpful in terms of allowing the State to decide what is the major contributor to the problem in a particular region and use the funds to address that.

Ms. DELAURO. Idaho feels the same way?

Mr. BAUER. Yes.

Ms. DELAURO. Okay.

In terms of educating the public on the nonpoint sources, whose responsibility is that, in your view? I mean, who should take that responsibility in telling folks that what they're putting on their lawns is a pollutant and so forth? Where does that lie?

Mr. BAUER. I'd like to address that. If you look at the State-Federal role, we believe that EPA's role is to provide the tools to the States. So, EPA could provide some information and education materials.

By and large, the real delivery system, because nonpoint source is an acre-by-acre problem, has to be at the State and local level. For example, we do use our soil conservation districts for information and education, and it really gets down to one-on-one in nonpoint source programs between a soil conservation district board member and the farmer/rancher out there to make headway with nonpoint sources. Programs at the national level, to me, simply aren't useful.

Again, the answer is send money, and we'll implement the programs.

Ms. DELAURO. Let me ask you, is it your view that the States have enough money to be able to disseminate the information and to make the problems well-known?

Mr. HUGHES. Let me state that in Delaware, conservation districts are an oddball sort of organization. I run them in Delaware, and they don't operate at a profit and in fact often operate at a loss, and they worry about money. That's their sole concern other than their job, which is to educate and help contact the people. They're a great delivery system, but they need money to do jobs, and if you give them a job and fund them, they'll do a heck of a job for you. But if they're not given funding, it's very hard for them to do it. They're in a tough position. They need to show some sort of—at the end of the year, they can't go broke.

Ms. DELAURO. For each of you, do you believe that you've adequately identified the sources of nonpoint source pollution? With your own resources, your own funding, your own efforts, have you really defined the problem?

Mr. ZIMMERMAN. In Delaware, I think the issue of pollution abatement has got to be a long term commitment, and we think we've got to approach it incrementally. Just like the act mandated point source controls as a first cut. Now that we've got our point source controls in place, we're seeing that the water bodies are still not meeting standards, and then we're focusing, appropriately so, on those sources that remain at the principally nonpoint source.

So I think as we get better science and understand the effects, we're going to know more tomorrow than we do today, and I think we've got a heck of a job in front of us right now dealing with nonpoint sources and just because there are so many people involved in that. There's not one source, one community that you can go to, one form of government that you can go to and say, "It's your responsibility to abate this source." There is a multitude of actors involved.

Mr. NEAFSEY. In broad, general terms, we believe that we've identified the problems, and I'd use combined sewer overflows for an example. However, in terms of having the knowledge or the expertise to know exactly what to do to address that problem, I don't think we're there yet, and that's where the technical guidance would be very helpful.

Ms. DELAURO. Mr. Bauer.

Mr. BAUER. I'd just like to add that I think it depends on what you want the information for. To say that we have sufficient information to establish program direction and get moving with a nonpoint source program, yes, we have that information. To say that we have sufficient information to establish trends and know if we're making progress, that's a different level of monitoring, and we don't have that kind of information.

Monitoring is another one of those forgotten elements in the Nonpoint Source Program. In fact, the Clean Water Act in general. It takes a lot of money to do good monitoring and to be able to actually track trends and be able to answer the questions that Congress is going to ask. Have you improved water quality? We can't answer that question very well, but we certainly have enough information to be able to establish a program and set direction.

Mr. HUGHES. Let me add that if we who are presumably experts have identified the problems, I can tell you that in Delaware we certainly haven't communicated that to our public. Our citizenry does not yet recognize the full import of nonpoint source pollution. We're just beginning that job. It's very difficult to sell and demonstrate. It's obviously nebulous in its character. That's a big problem, selling the program.

Ms. DELAURO. In terms of the monitoring that you all have mentioned, how should that be funded? I mean, whose responsibility should the monitoring be?

Mr. ZIMMERMAN. Well, I think we've got some existing Federal programs that do support in part State monitoring efforts, but I think what you're hearing is——

Ms. DELAURO. Are they working?

Mr. ZIMMERMAN. I think so. I think so. And I think what's happening, though, is we need better science. We're all the time developing laboratory techniques that will get us farther and farther along. We need to understand what that laboratory result means in the context of the environment, and we need to be able to better assess the data, and that comes with a better understanding of the science. So I think what's appropriate at the Federal level is an investment in the science and better indicators, more appropriate indicators, let's say, that can be used to evaluate the effect of nonpoint sources.

Mr. BAUER. I'll just add to that, States have different levels of infrastructure as far as monitoring is concerned. We haven't built the kind of monitoring infrastructure in Idaho that's necessary, and maybe some of the other States have the resources. Obviously, where should the money come from to fund monitoring? It should be some type of Federal-State sharing relationship.

In the last two years in our Idaho legislature, we've approached the legislature with funding specifically for monitoring to implement what's called anti-degradation policy, and we've been zero-funded both years, so we're frustrated at not being able to carry out the responsibilities that we have under the Clean Water Act and under State programs. So we'll be looking for funding wherever the sources are.

But, no, I don't believe we have adequate infrastructure and resources to really do the kinds of monitoring that's necessary. We're working on it very hard. It's a job that everybody wants us to do.

Ms. DELAURO. Okay. Thank you.

I'd like to turn the questioning over to my colleague, the ranking minority member of the committee, Mr. Packard.

Mr. PACKARD. Thank you, Madam Chairman.

I come from local government, my background, and I think I speak the same language that you do in terms of State and local government control of land use decisions and so forth. I will not burden you with further questions in that area, because I think you have expressed already my feelings on it.

Simply one question, Madam Chairman, and I would be very brief.

Do you see a difference from one State to another or from one region of the country to another in terms of the way in which individual States would address the nonpoint source pollution problem? Would Idaho handle it differently and would their mandates be different than that of New Jersey or of Delaware?

Mr. NEAFSEY. That is most definitely true, at least with respect to Idaho and New Jersey, and I think it's because of the nature of the population. Although we're known as "the garden state" and we do have a farming area in south Jersey, essentially we are an urban/suburban State.

Mr. PACKARD. The gentleman from Idaho?

Mr. BAUER. Yes, I definitely agree with that. We've tried to point out in our testimony the difference in the landscape, and therefore, the nonpoint source pollutants that we have to deal with. That's why it's very difficult, I think, for EPA to establish very specific programs. What they can establish, though, is the priorities and the incentives and provide the research. At the local level, the

States are best able to respond and implement programs, given the situation of both the pollutants, the funding resources, and the political-social climate, which is also very important to consider.

Mr. PACKARD. I think that's well stated, and I appreciate that. Comments from Delaware?

Mr. HUGHES. Mr. Bauer from Idaho mentioned that in Idaho, if they controlled erosion and sedimentation, they'd have a major portion of their problem solved. Well, we've already solved a lot of our erosion and sedimentation problems, but we've got big problems with nutrients and groundwater contamination from nutrients and surface water contamination from nutrients. That's our single greatest problem. So we are substantially different, and I would suspect in our northern county it might be toxics that is a big problem. So, yes, it's highly site-specific.

Mr. PACKARD. Thank you, and I appreciate very much the States' response to this hearing.

Madam Chairman, I would like to simply in conclusion ask unanimous consent that statements be made permissible from some of the agricultural interests that have requested that they be on record in this hearing—the cotton industry and other agricultural interests.

Ms. DELAURO. So ordered.

Mr. PACKARD. Thank you.

Ms. DELAURO. Let me just ask two or three more questions, if I might.

In terms of section 319, if you could amend it, how would you amend it to better meet State goals and needs?

Mr. ZIMMERMAN. I think the first thing I suggested was strengthening the Federal consistency provisions under 319. Also, clearly making a distinction that it is not a demonstration program, but rather it's an essential element to meet the Clean Water Act mandate of fishable and swimmable waters. So those are two suggestions, and then also emphasize the need for monitoring and directing EPA to assume a leadership role in both Federal coordination and in developing better techniques for monitoring.

Mr. NEAFSEY. New Jersey would agree with that.

Mr. BAUER. We would agree with the comments certainly on Federal consistency and EPA's coordination role. One additional element that is in the written testimony is, the need for an incentive for States to implement programs. Section 319, by and large says, "States, develop an assessment and develop a program plan," and it kind of leaves it at that, and there really is not a national objective—there's an objective, but there isn't a national schedule and framework. There isn't really any national direction that says, "Beyond that, States, you have to do something by certain dates to get with the program," and I think that's an important element, too.

We have made a lot of progress in Idaho. We've got a lot of things going, we've got a lot of agencies helping us, but I think sometimes States need a little boost as far as the State funding and State programs and being able to pass those laws. I believe Congress needs to send that message very clearly to the States. It's not just a State-local option to implement nonpoint source programs. It

is Congressional intent that we make progress on nonpoint source activity.

Ms. DELAURO. Do you find in working with the EPA regional office that they have devoted enough staff resources to section 319 in terms of being able to put together a nonpoint source program?

Mr. ZIMMERMAN. Given that, at least in our experience, the EPA role is one of oversight, and the actual implementation and organization of the program occurs at the State level and the local level, I think I would answer yes. I think we need more——

Mr. DELAURO. More staff?

Mr. ZIMMERMAN. At the State and local level, I think. Most importantly, at the local level. We need to be sure that we're using the best mix of resources there, because that's where we interface directly with the people that are responsible for the problems.

Mr. BAUER. In Region 10, EPA has put a great deal of effort on nonpoint source activities because of the importance, obviously, in our region of nonpoint sources. They have had some leadership in the staffing of their regional office, and they have one of the few nonpoint source people for EPA in the Idaho Operations Office. So I would agree. I think they have done what they can with their resources to provide appropriate staff for their job, and I agree that the funding should be focused at the State and local levels.

Ms. DELAURO. Let me just ask if within your State there has been an attempt to coordinate the monitoring and the control requirements of the section 402 Stormwater Program with the section 319 Nonpoint Source Program?

Mr. ZIMMERMAN. The Stormwater Program is still something we're—the regulations were just promulgated in November. Up to this point, the emphasis—and I assume that's what you mean when you talk about the section 402 Stormwater Program—prior to this, our efforts and our Nonpoint Source Program were focused on erosion and sedimentation control. We've had an erosion and sediment law in the State for quite some time, and our program did focus on that when it was developed in 1988.

We're now in the process of developing how we're going to manage the section 402 responsibilities. We are an NPDES-delegated State, and we see a lot of problems with trying to administer that particular component of our NPDES Program.

Mr. NEAFSEY. As a State, we coordinate our programs in that regard. We see the stormwater problem as essentially part of nonpoint source pollution, which I think is a little different than the way the EPA views it. The term I heard today was a "non-traditional" point source. I think that's the term that was used to refer to it. So we're hoping that they would view it more consistently or in a more coordinated fashion. At least that's how we view it, and as the program develops, we hope that it would work that way.

Mr. BAUER. In Idaho, the stormwater problem is very minor, and therefore we just have little experience with it.

Ms. DELAURO. I just want to be accurate in this characterization of the Federal agency coordination and its effectiveness. For instance, in EPA dealing with USDA or with the U.S. Forest Service. My understanding—and again I want to be accurate in my characterization—is that what you're looking for is more coordination of

the Federal agencies in this effort to make your jobs easier at the local level.

Mr. NEAFSEY. Yes.

Ms. DELAURO. I don't have any further questions, but let me just try to characterize a little bit of what you said in your testimony about the need for more Federal funding but flexibility in the use of that funding to deal with the nonpoint source areas, looking to EPA in terms of the Federal agency problem, which I just mentioned and which you've mentioned, and an increased Federal role in monitoring the nonpoint source pollution and developing new technologies. I just want to, as I say, characterize and summarize, if you will, so that we take these things into consideration when we're looking at the reauthorization.

Mr. BAUER. That's correct.

Ms. DELAURO. There are a number of attachments to the testimony, and we will make sure that those attachments are also in the record of the hearing.

Let me just say thank you to you all and thank you for your patience, and we really appreciate your testimony. Thank you for coming.

[Mr. Neafsey's prepared statement appears on page 99.]

[Mr. Hughes' prepared statement appears on page 73.]

[Mr. Bauer's prepared statement appears on page 49.]

Ms. DELAURO. The subcommittee stands adjourned.

[Whereupon, at 12:16 p.m., the subcommittee adjourned, to reconvene at the call of the Chair.]

PREPARED STATEMENTS OF WITNESSES

House Public Works and Transportation Committee
Investigations and Oversight Subcommittee

Testimony on Reauthorization of the Clean Water Act
Nonpoint Source Pollution Control

Mr. Chairman, members of the subcommittee, my name is Steve Bauer, Acting Manager, Surface Water Section of the Division of Environmental Quality of the Idaho Department of Health and Welfare. I am here today to discuss Idaho's experience with nonpoint source pollution control, especially as it relates to the GAO report, RCED-91-10, Water Pollution, Greater EPA Leadership Needed to Reduce Nonpoint Source Pollution.

We generally agree with the GAO report in identifying the barriers which impede state efforts and the recommendations which have been made. Specifically we would like to emphasize the following points:

1. Nonpoint source program development and management is best accomplished at the state and local level.

2. The nonpoint source program is severely underfunded. Greater federal funding is necessary for the states to make measurable progress in restoring and maintaining the quality of the nation's waters.

3. Federal consistency provisions in Section 319 of the Act are inadequate to assure that federal agencies are responsive to implementation of nonpoint source requirements.

4. EPA should provide greater emphasis at the national level to assure that federal agency programs complement rather than conflict with the Clean Water Act.

5. EPA should provide greater leadership in nonpoint source pollution research, criteria development, and development of monitoring methodology.

6. Idaho has a proven track record of reducing nonpoint source pollution based on the feedback loop concept. Given adequate funding and authority we believe this approach can work without causing undue economic hardship.

7. A back-up regulatory program for nonpoint source activities should be included in the Clean Water Act to be used if inadequate progress is being made through implementation of the state's programs.

8. EPA and the states should be directed to include ground water quality protection as a priority in their nonpoint source programs. A critical balance must be achieved to ensure that

best management practices to protect surface water do not result in a greater threat to ground water and vice versa.

Background on Idaho's Resources and Nonpoint Source Impacts

Idaho has 26,000 miles of streams and rivers, and over 225,000 acres of lakes. Idaho enjoys nationally-known wild and scenic rivers such as the Middle Fork of the Salmon River and Hell's Canyon of the Snake River. Many miles of streams are in high quality condition in the roadless and forested regions. Generally, our aquifers produce water of high quality for domestic water supply and irrigation. Well over 90 percent of the state's drinking water is supplied from its aquifers.

Idaho also has streams that have been impacted by nonpoint source activities which include agriculture, logging, mining, and road building. The State Nonpoint Source Assessment completed in 1987 assessed 16,000 miles (60%) of streams. Twelve thousand miles were determined to have nonpoint source impacts which either partially support or do not support beneficial uses. The most significant nonpoint source pollutant is sediment which was reported as a pollutant in 95% of all impacted waters. Agricultural activities account for 45% of impacted waters, hydrologic modification - 30%, forest practices - 17%, and mining - 10%. Localized and regional contamination of aquifers has occurred and some drinking water supplies have been threatened or eliminated by nonpoint source pollution. In contrast to nonpoint sources, point sources impact only 7% of the state's waters.

Over 63% of the state is in public ownership, managed either by the U.S. Forest Service or the Bureau of Land Management. Given this large acreage, the control of nonpoint source pollutants from these lands is critical to achieving Clean Water Act objectives.

1. **Nonpoint source program development and management is best accomplished at the state and local level.**

Nonpoint source impacts occur on an acre by acre basis. Best management practices need to be designed and implemented to meet the site-specific conditions at the local level. Programs implemented at the state and local level have flexibility to adapt to the site conditions.

For example, the Idaho Agricultural Water Quality Program is a voluntary program implemented at the grass roots level by the Soil Conservation Districts. Individual farm plans are developed in a project area to meet the water quality objectives for that piece of ground. This local management is necessary to assure efficiency in use of technical assistance and cost-share dollars. In the last ten years, Soil Conservation Districts working in partnership with the state Soil Conservation Commission, Division of Environmental

Quality, and federal Soil Conservation Service have implemented 26 watershed improvement projects affecting over 300,000 critical acres.

The decision to utilize a regulatory or nonregulatory approach should be a state decision based on the individual characteristics of the nonpoint source activity, the state infrastructure, and the social/political climate. Pollutants from forest practices, in comparison to agriculture, are controlled by a regulatory program, the Idaho Forest Practices Act, administered by the Idaho Department of Lands. Forest activities are based on long rotations of 60 to 100 years, therefore, the occasional harvest entry is best controlled by a regulatory framework. Both agricultural and forest practice programs have been working well in principle given the consideration of funding constraints.

2. **The nonpoint source program is severely underfunded. Greater federal funding is necessary for the states to make measurable progress in restoring and maintaining the quality of the nations waters.**

As noted in the GAO report nonpoint source control activities have not been funded adequately. The state has made significant strides in funding nonpoint source programs; in the last ten years Idaho has invested over $26 million dollars in the state Agricultural Water Quality Program. However, a comprehensive nonpoint source program will depend on a long term commitment of both federal and state funding.

Section 319 funding has been unreliable. Idaho received a $790,000 base grant in federal fiscal year 1990. In 1991 Idaho's base allocation dropped to $265,000, with a total target allocation of $530,780. This uncertain funding does not encourage states to develop the long term programs and infrastructure needed to achieve clean water. Nonpoint source pollution was not created in a day nor will it be resolved in a short period. Given this token funding, states and EPA will be forced into "band-aid" projects which will have minimal water quality impact.

Congress needs to give nonpoint source control the same commitment that was given to point source control in the early stages.

3. **Federal consistency provisions in Section 319 of the Act are inadequate to assure that federal agencies are responsive to implementation of nonpoint source requirements.**

The importance of federal lands in maintaining high quality waters in the western states should not be underestimated. In Idaho federal lands comprise over 33 million acres. Thirty-nine percent of the state is managed by ten national forests in two administrative regions. The waters within this jurisdiction are an important state and national resource for recreation, fisheries,

irrigation and domestic water supply. The petitioning of Idaho's chinook and sockeye salmon under the Endangered Species Act provides an example of the importance of protecting these high quality waters. Idaho federal ownership supports a large quantity of habitat for these petitioned stocks. The habitat cannot afford to be further degraded and still meet the needs of these important stocks as well as other water resources.

The Bureau of Land Management administers over twelve million acres (24%) which is characteristically comprised of arid rangelands dominated by sagebrush. These lands have historically been used for grazing. Although upland range conditions are improving, riparian areas are generally degraded and are not fully supporting beneficial uses. BLM recognizes the need for restoring these areas but, generally, lacks the resources and political support to do so.

Federal agencies have generally been cooperative with the state and provide assistance and expertise in water quality programs. However, we believe that the federal consistency language in Section 319 is inadequate for the following reasons.

1. The meaning of "consistency" is not clear and leads to state-by-state negotiation with the federal agencies.

2. The burden of gaining consistency is placed on the state through program and project review. The state can not afford the resources necessary to provide this degree of oversight.

3. The federal agencies should be placed on notice by Congress that they are required to comply with and need to initiate Clean Water Act activities.

At the Regional level the U.S. Forest Service has continued to question the state's authority in the Clean Water Act. The Forest Service position is to maintain maximum management flexibility by minimizing state authority. In addition, each national forest operates at a high degree of autonomy. The state will be unable to carry out the congressional mandate of protecting high quality waters given this current situation. The language of Section 319 should be modified to be comparable with Section 313 regarding federal facility compliance and clearly delineate the state's leadership role. In addition to providing a clear message to the federal agencies, Congress will need to examine the federal agency priorities and budgets. Congress should consider increasing line item appropriation in the agency budgets for Clean Water Act activities.

4. **EPA should provide greater emphasis at the national level to assure that federal agency programs complement rather than conflict with the Clean Water Act.**

As described above the burden for federal program consistency has

been placed on the states in Section 319. Although this is appropriate for consistency with the State Nonpoint Source Management Program, there is a need for a similar activity at the national and regional level. Most federal policies, especially for USDA agencies, are set at the national level. It is appropriate for EPA to have specific authority and resources to review the complex set of agency policies and programs for consistency with Clean Water Act objectives. As pointed out in the GAO report, some USDA policies conflict with Clean Water Act objectives. We can not resolve these conflicts of national policy at the state level. We believe that EPA should play a more active role in federal program review and have authority to affect change in policies that are not consistent.

5. **EPA should provide greater leadership in nonpoint source pollution research, criteria development, and development of monitoring methodology.**

EPA has not redirected the resources or had sufficient funding to fulfill these important leadership functions in nonpoint source pollution control programs. The scientific basis for nonpoint source controls, water quality criteria aimed at nonpoint source activities, and methods to monitor effectiveness of these controls are national research needs which need to be funded adequately. There is currently no overall research program at the national level.

EPA has provided some excellent products recently to the states through miscellaneous funding sources. Two examples include the report, Livestock Grazing on Western Riparian Areas (1990), by Ed Chaney, Wayne Elmore, and William S. Platts; and Forest Practices Monitoring Guidelines, by Lee McDonald (in progress). It is inefficient for each state to try to fund these research activities which are applicable at the national or regional level. Idaho has been a leader in developing sediment criteria and monitoring protocols. However, this work is being completed on a shoestring budget. Progress at this rate will continue to be slow.

6. **Idaho has a proven track record of reducing nonpoint source pollution based on the feedback loop concept. Given adequate funding and authority we believe this approach can work without causing undue economic hardship.**

The feedback loop concept of nonpoint source pollution control has been incorporated into the Idaho Water Quality Standards as the result of a lengthy public participation and consensus process. A procedure for site-specific application of best management practices (BMPs) is developed for each nonpoint source activity, and monitoring is used to evaluate the effectiveness of the BMPs. Changes are recommended to BMPs where they do not support beneficial uses of water, and monitoring continues to assure the practices revised are adequate. A major goal of the Idaho program

is to assure that all parts of the feedback loop are in place for each nonpoint source category.

Because nonpoint source activities are spread out geographically and encompass many disciplines no single entity can effectively implement the program. An emphasis is therefore placed on coordination and cooperation among many state, federal, and local agencies. We have seen progress made, for example, in revision of BMPs for forest practices, and in application of agricultural BMPs through the Soil Conservation Districts.

We believe that this concept of nonpoint source control provides an acceptable framework for achieving water quality objectives given an adequate level of funding and authority for implementation. However, I have pointed out that Idaho does not have sufficient resources to assure implementation of BMPs throughout the state or monitor their effectiveness. Achieving Clean Water Act goals and documenting progress toward this end will continue to depend on resources. Secondly, state implementation of nonpoint source controls depends on passage of state laws, rules, and regulations which provide sufficient authorities to carry out programs. Obtaining these authorities may depend on the level of social and political support at the state level.

7. A back-up regulatory program for nonpoint source activities should be included in the Clean Water Act to be used if inadequate progress is being made through implementation of the state's programs.

Although we believe that nonpoint source control programs are most effective at the state and local level, there needs to be sufficient incentive in the Clean Water Act to encourage states to adopt programs and to provide and maintain funding. If EPA, in their oversight function, finds that states have not reasonably implemented nonpoint source controls there should be a provision in the Act for a back-up regulatory system and an increase in the variety of economic incentives. EPA should periodically (for example, every five years) review state nonpoint source programs for satisfactory progress in meeting goals of the Act. EPA should be directed by Congress to develop a back-up regulatory system and publish it in the Federal Register. EPA should also be directed to investigate a wide range of economic incentives that could be used to increase adoption of nonpoint source controls. These federal incentives needs to be stated with enough clarity to assure that all states take their Clean Water Act responsibilities seriously.

8. Congress should provide strong direction on ground water quality protection to EPA and the states in the reauthorization of the Clean Water Act.

The Act should specify a ground water protection goal, direct EPA

to accelerate the promulgation of ground water standards, and provide a strong mandate to states to develop comprehensive programs to prevent ground water contamination.

State and federal programs that have traditionally emphasized surface water protection should be expanded to ensure that all water resources are adequately protected. Best management practices that address surface water should be evaluated with respect to ground water and modified and expanded where necessary. This is particularly crucial with respect to state and federal agricultural water quality programs. Additional research is necessary to develop best management practices for ground water impacts from nonpoint sources. EPA should provide strong leadership in ensuring that the previously mentioned federal agencies also expand their water quality programs to address ground water in a manner that is consistent with Clean Water Act objectives.

Thank you for the opportunity to provide this testimony.

United States General Accounting Office

GAO Testimony

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Greater EPA Leadership Needed to Reduce Nonpoint Source Pollution

Statement of
Peter F. Guerrero, Associate Director
Environmental Protection Issues
Resources, Community, and Economic
Development Division

Before the
Subcommittee on Investigations and Oversight
Committee on Public Works and Transportation
U.S. House of Representatives

Mr. Chairman and Members of the Subcommittee:

We appreciate the opportunity to be here today to discuss our report on problems inhibiting state and local efforts to control nonpoint source pollution--diffuse sources of pollution rather than pollutants discharged from a single, specific point source.[1] The report examined (1) the barriers that may be inhibiting state and local nonpoint control efforts, particularly federal programs contributing to the problem and (2) actions the Environmental Protection Agency (EPA) can take to better focus federal efforts on reducing nonpoint source pollution. We will also provide observations about the likely impacts of the agency's fiscal year 1992 budget proposal on its efforts to control nonpoint source pollution.

In summary, Mr. Chairman, we found that the major barriers impeding state and local government efforts to deal with nonpoint source pollution include (1) the inherent conflicts that exist between some federal agencies' policies and states' water quality goals, (2) insufficient monitoring data on the scope and impact of the problem and the effectiveness of potential solutions, (3) insufficient technical information available to the states to set state water quality standards for nonpoint source pollution, (4) limited resources available to state and local governments in

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[1]Water Pollution: Greater EPA Leadership Needed to Reduce Nonpoint Source Pollution (GAO/RCED-91-10, Oct. 15, 1990).

comparison with the magnitude of the problem, and (5) the political sensitivities involved in controlling local land uses that indirectly cause water pollution.

To deal with these issues, EPA developed an ambitious 5-year agenda covering fiscal years 1989 through 1993. However, midway through that 5-year period, it is clear that the agenda will remain largely unfulfilled if the agency stays on its present course. Resource constraints are an underlying problem, as they are in many other EPA programs. In this case, however, we believe the limited resources allocated to EPA's nonpoint source control activities reflect an inappropriate emphasis on the agency's point source pollution control programs at the expense of its nonpoint source programs. We base our belief on EPA's own findings, which suggest that risks posed by nonpoint source pollution are generally more serious than those discharges posed by point sources. In its fiscal year 1992 budget request, EPA has increased the imbalance between point and nonpoint control activities by requesting reductions in funding for nonpoint source management grants to the states.

Before I discuss our findings in more detail, I would like briefly to provide some background about our nation's nonpoint source problem and EPA's role under the Clean Water Act.

BACKGROUND

Although significant efforts have been made to restore the quality of the nation's waters since the Clean Water Act's passage in 1972, many of these waters are still heavily polluted. Moreover, the toxicity and potential health effects of many of the contaminants being detected in these waters have generated increased concern in recent years. According to the EPA, the nation's remaining water quality problems are largely attributable to pollution from nonpoint sources.

Nonpoint source pollution is the by-product of a variety of land use practices, including farming, timber harvesting, mining and construction. It also results when rain washes pollutants in urban areas into storm drains, creating what is known as urban runoff. Agriculture accounts for the largest share of the nation's nonpoint source pollution problem, affecting about 50 to 70 percent of assessed waters through soil erosion from croplands and overgrazed rangelands and from runoff of pesticides and fertilizers.

Land use can substantially affect the volume of nonpoint source pollution runoff. For example, even though some soil naturally erodes from undisturbed land, erosion can increase significantly if trees are cut or land is farmed.

As a result of political sensitivity over land use issues, coupled with the decentralized nature of the problem, the Congress has historically been reluctant to allow the federal government to deal directly with nonpoint source pollution. The 1972 Clean Water Act, for example, required state and local governments to identify both their nonpoint source problems and ways to control them. However, the act did not provide either funds for implementing controls or direct authority for EPA to regulate nonpoint sources. The Water Quality Act of 1987 expanded EPA's role somewhat but still leaves primary responsibility for nonpoint source pollution with the states. The 1987 act requires states to (1) assess the extent to which nonpoint sources cause water quality problems and (2) develop management program plans for addressing these problems. EPA is charged with reviewing and approving these assessments and plans.

BARRIERS IMPEDING STATE EFFORTS TO CONTROL NONPOINT SOURCE POLLUTION

From our work in 6 states and our discussions with federal officials and representatives of environmental organizations, we identified the following key barriers that impede state and local efforts to control nonpoint source pollution:

-- Federal agencies sometimes pursue their primary missions in ways that inadvertently conflict with the Clean Water Act's objective to protect and restore the quality of the nation's waters. In particular, many U.S. Department of Agriculture (USDA) programs and policies involve--and even promote--increased nonpoint source pollution. For example, USDA's commodity price and income support programs encourage farming practices that contribute to soil erosion and nonpoint source pollution. As we have noted in the past, USDA's policies have traditionally encouraged specialization in program crops year after year and promoted farming practices that may increase the need for agrichemicals, including synthetic fertilizers and pesticides. While the Food, Agriculture, Conservation, and Trade Act of 1990 put greater emphasis on protecting water quality, changes in farming practices will likely occur over a long period of time. Other agencies whose activities significantly affect nonpoint source pollution control efforts include the Department of the Interior, which regulates mining activities, and the Department of Transportation, which funds highway construction projects.

-- Vital monitoring data are missing on both the scope and impacts of the nonpoint source pollution problem and on the effectiveness of potential solutions. Without information on the scope and impact of the problem, public officials

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have had difficulty reallocating resources towards the most serious problems and convincing landowners of the need for action. Washington state officials, for example, told us that with only 12 percent of the state's 40,000 river miles assessed for nonpoint source pollution from silviculture, their ability to identify the extent of the problem is limited. Similarly, federal and state officials told us that basic monitoring data, which are needed to identify the cause of the problem and to evaluate the effectiveness of alternative actions to control it, are generally not being developed.

-- States need information from EPA to help them set state water quality standards. These standards are essential to identify the concentration at which a pollutant becomes a problem. In particular, states require information to develop adequate standards for protecting groundwater because no federal program currently provides this information.

-- The cost of controlling nonpoint source pollution far exceeds available resources. Although some states have allocated millions of dollars to address the problem, they maintain that billions are required to correct it. For example, Pennsylvania, with 1,701 stream miles polluted by acid mine drainage from abandoned coal mines, has estimated

the cost to address only the drainage from these mines at between $3 billion and $5 billion.

-- Land use practices and patterns of millions of property owners and others are often at the root of nonpoint source pollution problems. These problems can be controlled by preventing certain land uses or ensuring that land is used in an environmentally acceptable way. We found that political sensitivity over land use regulations has been one of the most difficult barriers for states to overcome in dealing with nonpoint source pollution. This sensitive issue requires reorienting basic value systems that have often placed private property rights above other considerations--such as the impact of land use on water quality.

LOW FUNDING LEAVES EPA GOALS UNFULFILLED

As the federal agency primarily responsible for implementing the Clean Water Act, EPA is uniquely situated to help control nonpoint source pollution. EPA acknowledges this responsibility in its Nonpoint Sources: Agenda for the Future, published in January 1989. This document presents an ambitious plan for EPA to deal with nonpoint source pollution for fiscal years 1989 through 1993. EPA declared that its goal is to provide strong leadership for the

national nonpoint pollution control program and to help states and local governments overcome barriers to successful implementation of nonpoint source measures.

Nevertheless, we believe EPA's agenda has been and will continue to be unfulfilled if the agency remains on its present course. Resource constraints are an underlying problem, as they are in many environmental programs. For example, EPA's agenda identifies the importance of the agency's role in developing a stronger partnership with other federal agencies and in ensuring that federal regulatory requirements are implemented in a way that aids states in managing their nonpoint source control programs. While EPA has made at least some progress in this respect with USDA, it has done little with respect to the numerous other agencies whose activities affect water quality.

To deal with these agencies, EPA chairs an intergovernmental nonpoint pollution task force that is supposed to bring together numerous agency officials to discuss nonpoint source conflicts and opportunities for interagency cooperation. However, the task force has not met since October 1988. According to the Chief of EPA's Nonpoint Source Control Branch, resource constraints have prevented the agency from pursuing the problem beyond the limited efforts underway to deal with agriculture-related nonpoint source pollution problems. He noted that the limited EPA nonpoint staff has had to devote most of its resources to developing program

guidance and reviewing state assessments, management plans and grant proposals. Severe limitations on staff and resources have also affected EPA's efforts to develop better nonpoint source pollution monitoring techniques, help states develop water quality standards, and perform other critical functions identified in its agenda.

LOW FUNDING PRIORITY INCONSISTENT WITH ENVIRONMENTAL RISK

Because of limited budgetary resources, it is important that the environmental risks posed by alternative pollution problems be considered in funding decisions. However, despite the emergence of nonpoint source pollution as the nation's primary water pollution problem, EPA's budget priorities have been consistently and overwhelmingly oriented towards point source problems.

In an August 1989 report assessing the comparative risks posed by alternative pollution problems, three EPA regions analyzed a list of 18 to 24 of the most important environmental problems facing their region.[2] Each region then ranked each problem in terms of its relative health and ecological risk. EPA found that ecological risks posed by nonpoint source pollution are substantially more serious than those posed by pollution

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[2]Environmental Protection Agency, Comparing Risks and Setting Environmental Priorities (Washington, D.C.: Aug. 1989).

discharges from point sources. The study also concluded that point sources and nonpoint sources of water pollution appear to pose roughly comparable health risk. Among the key health risks associated with nonpoint source pollution was bacteriological contamination of shellfish.

In a similar analysis, EPA's Science Advisory Board noted that states found that nonpoint sources contributed to impairment of beneficial uses in many more miles of streams than did point sources. The Board noted in its September 1990 report that EPA needed to reflect risk-based priorities more effectively in its planning and budget processes.[3]

Historically, however, EPA has consistently and overwhelmingly given priority in water pollution control to funding for point source pollution problems. For example, less than 6 percent of fiscal year 1990 funding for the agency's point source- and nonpoint source-related water pollution control activities were devoted to nonpoint-related activities. Moreover, EPA had requested only $22 million out of the $400 million authorized in section 319 of the Clean Water Act for the funding of state management grants for the period of fiscal years 1988 through 1991. (See attachment I.)

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[3]EPA's Science Advisory Board, Reducing Risk: Setting Priorities and Strategies for Environmental Protection, (Washington, D.C.: Sept. 1990)

EPA officials have explained the limited funding requested for state management grants by noting that funds were available to the states to fulfill section 319's requirements under other sections of the act, such as the new State Revolving Loan Fund (SRF) program. While SRF funds are nominally available to implement nonpoint source management plans, information from both EPA and the states we visited indicates that these funds will largely be needed for the construction or modification of waste treatment plants, that is, control of point sources. In fact, in its recent nonpoint source annual report to the Congress, EPA itself noted that states were unlikely to use SRF funds for nonpoint source management programs "largely because of the high priority accorded to construction of publicly owned treatment works."

FISCAL YEAR 1992 BUDGET REQUEST CONTINUES
EPA'S LOW PRIORITY FOR NONPOINT SOURCE POLLUTION

To help correct this funding imbalance, we recommended in our October 1990 report that EPA identify appropriate funding levels that better reflect the risks posed by nonpoint source pollution and that will allow the agency to pursue key elements of an effective nonpoint source agenda. Importantly, we emphasized that we were not seeking a wholesale revision in the agency's water quality budget strictly in line with perceived environmental risk. We noted, however, that some shift in priorities could go a long

way toward allowing EPA to implement its agenda and thereby assist state and local nonpoint source pollution control programs.

Nevertheless, the agency proposes to increase the funding imbalance between its point and nonpoint source programs with its budget request for fiscal year 1992. Despite the compelling rationale for increased priority for nonpoint source pollution control, EPA is proposing a cut of about 50% in the section 319 grant funds for the states from the fiscal year 1991 level. In its budget justification, EPA said "the decrease is based on the fact that local government land use decisions and agricultural practices cause most [nonpoint source pollution]" and that "it is inappropriate for the Federal government to involve itself too heavily in these local responsibilities". However, state and local governments have emphasized that while EPA should not become involved in local land use decisions, they still need EPA assistance in their efforts to control nonpoint source pollution.

Not only does EPA's budget request inadequately support state programs, it also severely limits the agency's ability to meet its own responsibilities under its nonpoint source agenda, such as developing monitoring techniques and information the states need to develop water quality standards. In fact, a December 21, 1990 memorandum by the Director of EPA's Assessment and Watershed Protection Division indicated that significant vulnerabilities, as defined under the Federal Managers' Financial Integrity Act,

presently exist in the Section 319 grant program. Specifically, the memorandum notes that insufficient EPA staff exists to oversee the $51 million in nonpoint source grants provided to the states for fiscal year 1991. It noted that the program's vulnerability to fraud, waste, and abuse will increase under the fiscal year 1992 budget proposal because additional nonpoint source responsibilities have been added under the Coastal Zone Management Act Amendments of 1990 while staffing will remain essentially at the same level.

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In summary, Mr. Chairman, progress in attaining the nation's water quality goals will be difficult until nonpoint source pollution is effectively addressed. We believe that as the organization primarily responsible for implementing the Clean Water Act, EPA should be taking a leading role in helping state and local governments deal with this problem. Accordingly, as we recommended in our report, we believe EPA should accelerate its efforts to:

-- resolve problems arising out of conflicts between the policies of federal agencies and water quality goals;

-- develop nonpoint source pollution criteria so the states can develop and implement nonpoint source water quality standards;

-- develop monitoring techniques to help states determine the extent of their nonpoint source pollution problems and the effectiveness of corrective actions; and

-- develop its program to educate the public about the health and environmental impacts of nonpoint source pollution.

EPA's January 1989, 5-year agenda would accomplish many of these goals. For example, it calls on EPA to develop better monitoring techniques and to provide information to the states that will help them develop nonpoint source water quality standards. However, the agenda stands little chance of being fulfilled because of staffing and budgetary constraints. While such constraints affect many environmental programs, they have been exacerbated in this particular case by funding priorities that over-emphasize point source pollution control at the expense of nonpoint source pollution.

We believe that the President's fiscal year 1992 budget request afforded EPA a key opportunity to more closely align its activities based on relative risk to health and the environment. However, in light of the imbalance that EPA continues to propose in its water quality programs, it will be up to the Congress, through the fiscal year 1992 budget process, to assure limited funds are used more effectively in cleaning up the nation's polluted waterways.

Mr. Chairman, this completes my prepared statement. I would be pleased to respond to any questions you or other members of the Subcommittee may have.

ATTACHMENT I

ATTACHMENT I

Funding under Section 319 of the Water Quality Act

Dollars in millions

Fiscal year	Authorized	Requested	Appropriated
1988	$ 70	$ 0	$ 0
1989	100	0	0
1990	100	7[a]	38.9
1991	130	15	51
Total	$400	$22	$89.9

[a]In fiscal year 1990, the President's budget requested $7 million under another section of the act for the states to implement their management plans under section 319.

REMARKS TO THE SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT

BY: JOHN A. HUGHES, DIRECTOR
DIVISION OF SOIL AND WATER CONSERVATION
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Delaware was the first state to receive Environmental Protection Agency approval and funding for its 319 Non-point Source Program. We have by now had considerable experience with working with the Federal Government in this new, inexact, and unfamiliar area.

Let me state from the beginning that we agree with both the Environmental Protection Agency and General Accounting Office assessments of the importance of the problem. Delaware's high percentage of arable land, absence of any national parks, and low population density over the bulk of its land area make agricultural non-point source a major concern. Rapid development around our inland bays threatens our most valued natural area, and heavy industry in and around Wilmington, combined with suburban sprawl has given us unenviable parity with larger and more publicized urban and industrial centers. Our non-point source program, briefly delineated in Attachment "A", is intended to meet the highest standards of environmental concern from both the Federal Government and our own citizens. To that end, we have devised programs in every area of concern delineated in the General Accounting Office report, each devised by reviewing known existing and successful programs and tailored to Delaware's needs.

Attachment "B" represents our approach to just one area of concern - urban stormwater. Animal waste systems, (Attachment C) water quality standards, groundwater protection, freshwater wetlands, agricultural drainage systems and farming practices, from no till crops, to proper disposal of the poultry industry's normal bird mortality have received, or are receiving comprehensive, attention in Delaware.

In addition, we have funded major, broad-spectrum efforts within critical watersheds. The Inland Bays Recovery Initiative addresses 38 recognized environmental problems within a single watershed and tracks and measures each one. Its high visibility and public acceptance have focused attention on non-point source for the first time. Within the initiative, we have designed updated conservation plans which incorporate the full range of environmental concern applicable to farming. With the Delaware Cooperative Extension Service and Soil Conservation Service help, through the delivery systems long ago perfected by the Conservation Districts we are able to offer cooperators a site-specific review of their environmental and farming practices which ensures sustainable, environmentally enlightened agriculture.

We have reviewed and discussed among ourselves the General Accounting Office report to this subcommittee and find in it substantial areas of agreement. We too, feel that the time has come to consider matching funding to its environmental productivity. We lament that the current pattern of land use prevalent throughout our State consumes land in great chunks without even perfunctory consideration for our future.

If we differ, it is with regard to a stated impatience with progress made so far. We remind you that we are only now entering into the third budget cycle in a new, totally different, non-regulatory program which breaks sharply with the Environmental Protection Agency's experience and techniques of the past.

There will be few milestones in the fight against diffuse pollution but many beginnings. Unlike the dedication of a vast new treatment plant, no valves will be turned. Rather, in thousands of locations, improved techniques will have incremental effects on water quality which will only be appreciated over decades. In taming this different breed of cat, public education must encourage funding, which must precede regulation. As a case in point "bad farming" laws are possible only when good farmers call for them. In Delaware, that time will come only after we have enabled our citizens to know what is right, then helped them do it. Essentially, this is no different from the Federal cost sharing offered municipalities under the point source program.

I appreciate this opportunity for comment and invite any and all of you to share our successes and help us with our problems on site, in Delaware - preferably some fair summer day.

ATTACHMENT A

The Teamwork Approach
FIGHTING NON-POINT SOURCE POLLUTION IN DELAWARE

The Delaware NPS Program, which began in 1988 on a grant from the Environmental Protection Agency, brings together a team led by the D.A.C.D. and including the Departments of Natural Resources and Environmental Control and Agriculture, the Delaware Nature Society, The Delmarva Poultry Industry, the USDA Agricultural Stabilization and Conservation Service, the USDA Soil Conservation Service, the University of Delaware Cooperative Extension Service, and the University's College of Agricultural Sciences.

There are four demonstration watersheds involved in the state's NPS effort: the Middle Run/Upper Pike Creek Watershed, in New Castle County, the Murderkill River Watershed, in Kent County; and the Nanticoke River and Inland Bays Watersheds, in Sussex County.

In each area, the team is involved in a variety of action, designed to help farmers, towns, developers and other land owners control NPS pollution.

In the Middle Run/Upper Pike Creek Watershed:

* Work has begun on an artificial wetland on property belonging to the Independence School. This **Demonstration Project** will serve as an erosion control system and will become a focus for educational efforts.

* NPS Fact Sheets and a series of Clean Water Brochures which address the ways property owners can tailor their activities to stem NPS impacts have also been prepared.

In the Murderkill River Watershed:

* Cost sharing has been provided to establish a **Demonstration Project** in which a farmer has built a pesticide mixing shed. By keeping such chemicals under properly designed cover, farmers can reduce the chance that they will wash into the state's waters when it rains.

* Cost sharing has been provided for a **Demonstration Project** in which a dairy farmer has built an agricultural waste management system. The system is designed to control and, where possible, to recycle the wastes generated by his operation, thus reducing the chance that they will wash or seep into state waters.

In the Nanticoke River Watershed:

* Modern dead bird composting units have been designed for farms throughout the watershed. Solving the problem of dead bird disposal has been targeted as a major component of the NPS effort.

* A soil survey has been completed for the watershed. Several new soil types have been identified.

In the Inland Bays Watershed:

* Conservation plans for individual farms are under development, in a cooperative effort with the Inland Bays Recovery Initiative which has provided funds for additional planners.

* A study of groundwater recharge areas in the watershed is under way. When complete, this study will help local planners make wise land use decisions.

Other initiatives in place in the four watersheds include:

* Erosion and Sediment Control site inspections.

* Ongoing Water Quality Monitoring based on Biological Criteria.

* Ongoing training for pesticide users.

* Establishing best management practices -- manure and nutrient management, integrated pest management, erosion and sediment control, grass strips along waterways.

Components Necessary for an Urban Stormwater Management Program

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Abstract

This discussion is based on my experiences in the development and implementation of statewide stormwater management programs in Maryland and Delaware. Based on these experiences, a number of program components may be considered generic and will be documented here.

This assessment will provide recommendations and information on the following items:

1) Problem assessment and magnitude
2) Design Considerations
3) Implementation Strategy
4) Common and Unique Problem Identification
5) Cost Estimation and Funding Sources
6) Education, Training, and Publicity
7) The Role of Wetlands
8) Conclusion

Problem Assessment

Most regions of the United States are experiencing rapid growth at this time and a review of water quality data generated through the National Urban Runoff Studies (NURP) in conjunction with specific studies conducted in Maryland, Delaware, Puget Sound, and in other areas of the country clearly indicate that water quality impacts are occurring. The urbanization that is occurring in this country, and its estuaries in particular, is a common problem in the character and variety of pollutants that are present in the storm runoff. Those pollutants include numerous metals, inorganic and organic compounds, as well as petroleum products. Toxicants commonly found include oil, grease, chlorides, and metals such as lead, zinc, bromium, arsenic, silver, cadmium, iron, and copper. Most of these pollutants enter the waterways from road surfaces and derive from rust, lubrication, tire wear, and engine exhaust. In addition, most of these substances are inert by nature and readily attach to sediment particles. Because of this attachment, the need to limit the movement of sediment downstream is important if their water quality is to be maintained or improved.

Most people believe that conveyance of stormwater to the tidal limits will allow those pollutants transported by stormwater to be carried out to sea. That assumption is generally not correct. Most estuaries are very poorly flushed and the pollutants that enter them will accumulate, and continued environmental degradation can be expected. Estuaries, similarly to lakes, can essentially be considered as sinks where pollutants discharged into them tend to remain. This can be demonstrated easily in situations such as the Chesapeake Bay, the

Delaware Inland Bays, and elsewhere where pollutants have accumulated to such an extent that the productivity of the estuaries are being threatened. People need to understand that there is no such thing as away. Waste oil, toxics, sediment, and nutrients placed in streams are only transferred to another location in the water network, and there will be impacts.

Historically, the major impetus for stormwater control has been flood damage resulting from improper use of floodplain lands for developmental purposes and increasing discharges due to the conversion of land to more impervious surfaces. Stormwater and flood control structures were originally implemented to reduce the level of downstream flooding and protect existing land uses. Stormwater management for flood control purposes must be considered in conjunction with wise land use decisions regarding tidal and nontidal floodplain land uses. Existing floodplain land must be preserved through a regulatory program so that existing problems are not exacerbated. In addition, the cost of protection of floodplain properties may exceed the value of the properties being protected. In those situations an acquisition program can be an important component of a flood control program to ensure that floodplain land is preserved. A stormwater program whose main emphasis is flood control and flood protection must be implemented on a watershed basis. Rather than require that each developer control the release of stormwater for large storms to a predetermined release rate, sites should be selected based on a watershed analysis that optimize control benefits. Too many random flood control structures on a single watershed may increase downstream flood levels due to inappropriate placement of these structures. Water quality protection is most appropriately addressed on small watersheds or on individual sites while water quantity protection is most appropriately provided on a regional watershed basis.

It must be understood that fisheries protection can only be provided on a limited basis by the application of stormwater management. Habitat protection is to a very large extent determined by land use. If the protection of cold water fisheries is a priority, consideration of developmental patterns must be a program component. Environmental protection can only be attained through a holistic approach to man and the environment. Technology alone will not provide environmental protection as there must exist a natural harmony for all system components to function as a unit. Too often a governmental agency will throw words at a problem and provide a false sense of well-being. A stormwater management program whose main purpose is to provide environmental protection is no small undertaking. Initial program implementation tends to simplify the problem. Recognizing the magnitude of program components at the initial stages of program implementation will provide a necessary direction to program implementation.

Design Considerations

Data can be developed, or is already available, that would provide a statistical record of rainfall events that occur on an annual basis. A water quality program could be developed that recognizes rainfall depths, durations, frequency of occurrances, and seasonal distribution. Designing a water quality strategy to treat a percentage of the annual storm runoff will provide a significant water quality benefit. Consideration of depression storage (puddles), in conjunction with open space requirements can reduce the amount of storage needed to a lesser amount.

Based on local situations, the initial runoff from all contributing impervious areas should be treated for water quality enhancement. It must be recognized that providing water quality protection for only a percentage of the rainfall events will still mean that some portion of the annual runoff will be released untreated. That tradeoff is necessary due to the extremely large volumes of runoff that are associated with larger storms. Practices such as off-line storage can still provide significant water quality benefits by interception of the initial frequent runoff events and allowing the excess runoff to bypass the initial flush control structure. A weir structure in the main channel can divert the initial runoff into the water quality practice while the larger flows overtop the weir structure and continue downstream. It must be understood that development and man's activities will cause adverse impacts. Stormwater management attempts to mitigate,to some extent, those impacts but a 100% level of protection cannot be obtained. Implementation of control requirements on new developments, in addition to retrofitting existing uncontrolled developments, can maintain a water quality balance.

As water quality protection is a major component of the overall stormwater protection strategy, detention time for the release of the first percentage of runoff should be at least 24 hours. It is also recommended that dead storage by means of a permanent pool be provided to enhance pollutant removal effectiveness. The permanent pool should have at least 25% of its surface area less than 1 m in depth to promote the establishment of wetlands vegetation. Standards for the type of wetlands plants that should be established can be easily developed locally. Primary characteristics of those plants should be length of growing season and local suitability.

From a water quantity perspective, multiple storm control would provide the greatest benefit for downstream protection when used on a regional basis. The 2 and 10 year frequency storms are examples of storms that could be controlled to pre-development levels as a general guide unless a specific condition would necessitate a greater level of control. Any time that water quantity control is required, the downstream effects of hydrologic timing modification must be considered. This analysis of timing should be carried downstream to the next control point, which may be a road stream crossing or the confluence of a larger stream tributary.

The use of infiltration practices must be carefully considered due to the susceptability of these practices to clogging. If stream habitat protection is a major program component, infiltration must be considered if porous soils are prevalent in the watershed. Increased impervious land would reduce natural infiltration and lower groundwater tables which may convert a perennial stream into an intermittant one, thus destroying any hope of aquatic diversity. Infiltration cannot be used anywhere. The successful implementation of these practices depends on soil conditions, slope of the site area, depth to groundwater, and depth to bedrock. Maintenance of these practices is extremely important and can be difficult once clogging has occurred.

Ancillary programs to protect floodplain areas, existing wetlands, and maintenance of open space will provide water quality benefits in addition to their primary justifications. These areas provide water quality benefits due to their buffering capability for suspended solids.

The existing situation with respect to sediment control also needs to be evaluated and improved on a national basis. Most existing criteria needs to be

updated with more types of control practices included, and the practices need to provide a reasonable level of site control. A clear distinction needs to be made with respect to the types of practices that are appropriate for dispersed flow and the types of practices that are appropriate for concentrated flow. The concentrated flow practices need to be sized more appropriately for the character of the soils that are prevalent to the local vicinity.

Another aspect of local sediment control programs that needs to be re-evaluated is the size determination for when a sediment control plan needs to be submitted. Most existing criteria tends to be too large, and many projects have no regulatory requirements placed on them. In addition to the regulatory control, there is a serious need for additional sediment control inspectors. My experience suggests that one inspector can visit approximately three large sites per day, and that the frequency of inspection of active construction sites should be at least once per two week period. There is an existing and growing problem with respect to sediment control that must be addressed in an aggressive manner to reduce downstream impacts. One benefit of reducing the exemption area even with inadequate staff, is that the process allows an enforcement mechanism when complaints are received.

Implementation Strategy

There are a number of steps that need to be considered for the development and implementation of an effective urban stormwater management program. An early and ongoing need is to increase public support for the program through an educational effort. This effort must be developed and continued as a permanent function if public support is to be galvanized and maintained. This aspect of program implementation will be discussed later in this assessment. Also necessary as a public educational component would be the construction of typical water quality enhancement practices as demonstration projects. People could then physically see what this program encompasses and the benefits that can be gained through program implementation.

With the recognition that water quality conditions cannot be improved overnight, the stormwater program should not be implemented in a crisis mode. The top priority should be to prevent the further decline of the region's water resources. This would necessitate the implementation of stormwater quality control on new residential, commercial, industrial, and institutional projects. This can be accomplished by a two tier approach that will depend on several factors including the size of the project and its drainage area.

- Projects of larger magnitude will be required to provide water quantity/quality protection with water quantity being subject to a waiver if watershed location would indicate that quantity control as being counterproductive. A fee structure should be established that provides a system for payment of a waiver fee. That fee would be based on the cost that would be incurred if on-site peak control was required. Certain projects may be suitable for both a water quantity/quality waiver and a fee structure should also be established for both.

- Projects of a smaller size should be considered only for water quality requirements on a case by case basis. The same fee structure as developed for larger projects (including the water quantity waiver) can also be provided for these smaller projects.

- Funds collected under the waiver fees can be used to provide regional water quantity/quality control based on watershed studies, also accomplished using the waiver fees. Regardless of the waiver fees, a permit fee should be required to offset the cost of plan review and inspection and enforcement.

An option to states or regional authorities providing full program implementation, meetings should be held with local governments to determine the interest of the local governments in providing program implementation. This could be accomplished through a form of delegation of authority by the states or regional authorities with subsequent overview and periodic evaluation of program performance to determine whether delegation should be continued. The main burden for program implementation should probably still rest with the states or regional authorities but some local governments may want to maintain a local presence. Stringent guidelines should be established for this delegation of authority and those guidelines should include such items as legal authority, manpower, administrative procedures, and a review of field implementation.

As the program requirement for new development activities is established and implementation proceeds, a second phase of the overall program should be pursued. A prioritization of impacted watersheds should be initiated and a stormwater retrofit program implemented. Based on a watershed approach, sites could be acquired that would be retrofitted with water quantity/quality practices that would improve the overall conditions of the specific watershed. There are a number of possible funding mechanisms that are available to implement a program such as impact fees and user fees, and those alternatives will have to be investigated.

Sediment control is an area that will also have to evolve over the next several years. The first step should be the assessment of existing standards and specifications. In addition to the personnel needs and disturbed area considerations, site visit and enforcement procedures need to be developed and clearly stated. Sediment control is difficult to monitor and there is little incentive for the land developer to implement and maintain the needed practices. Enforcement penalties and options must be available for the situation where site compliance is difficult to obtain. Those options should include the ability to stop construction, possible civil fines, possible criminal penalties, and other options as the need arises. Fines collected should be used to fund needed areas within the overall stormwater program.

To assist contractor efforts to implement these required practices, educational programs should be developed having required contractor attendance (one person at least from each contractor) so that the importance of the practices can be stressed and implementation improved. Other educational programs need to be developed for the engineering design community and those individuals involved in the plan review process.

One process that may be helpful is a service that the State of Delaware provides to proposed land developers that is called DAS (Development Advisory Service). One day per month all regulatory agencies have representatives assembled to meet with land developers regarding proposed projects. At that time developers are presented with a list of requirements that they then must address to obtain the necessary building approvals. This process takes place during the conceptual design phase and is extremely popular with land developers as they are aware of regulatory requirements at design outset.

Of primary importance, any requirements must be consistently implemented to all land developers to avoid any inference that one individual or entity is being unfairly treated. This program and the associated practices will cost money. The costs, when incurred by land developers, will be transferred to the consumer or property purchaser. If all developers have the same relative costs for stormwater control, there would be no economic advantage for any one developer, and the criticism regarding program implementation would be significantly reduced.

Common and Unique Problem Identification

There are a number of problems that appear fairly common in certain regions. Probably the most important area of commonality is the character of the stormwater runoff from urbanizing areas. The types of pollutants found in the Washington D.C. runoff are very similar to the types of pollutants contained in urban runoff in other U.S. cities. The only major differences are with respect to the magnitude of the problem.

Another area of commonality is with respect to the project approval process. In most urban areas in the U.S., projects must receive prior approval before the initiation of construction. For this reason the approach to stormwater management and sediment control can be similar. These programs have a much greater potential for success if the site planning is accomplished at an early stage and possible adverse water quality impacts are addressed either through on- or off-site requirements. Also, the use of design documents can greatly assist the design community and the general public in understanding the types of control practices that are needed, and accepted by the approval authority, in addressing the stormwater issue.

Another common area is the need for public and political education as an important component of program implementation. Experience in this field has shown the value of public and political support. The situations are similar in the types of educational activities that are available and most estuarine areas provide a rallying point for promoting the water quality benefits and the need for environmental protection.

In the U.S., federal law really specifies the minimum content of any issue that must be regulated, and the States may exceed those federal requirements as the local need arises. Thus you have certain areas of the country that address various environmental needs through more aggressive programs such as the Puget Sound restoration effort and the Chesapeake Bay program. Unfortunately, the problems tend to have to reach crisis proportion before these efforts seem to really become aggressive.

One major difference around the country is with respect to soils and geology. The predominant soils, slopes, and geology of various areas determine the types of BMPS (Best Management Practices) that are feasible as management tools. Practices that rely on infiltrating surface runoff into the subgrade will not be practical to pursue on clay type soils due to the tight nature of those soils and their high shrink/swell potential. Certain areas of the U.S. are very young geologically and do not have the variety of soil conditions that exist in other areas. The major management practices in areas of tight soils will be ponds and maximization of open space through land use decisions. The

clay nature of the soils also creates additional problems with respect to settling of particulates when the clay soil gets into suspension. To get reasonable sedimentation, ponds may have to be larger in some regions than in others, and a greater use of wetlands vegetation would assist in that sedimentation process through flow retardance.

Cost Estimation

Rather than repeat information that exists in other documents, one document that exists is "Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs". The costs for BMP design, construction, and maintenance is extremely variable and the document has a good discussion in those areas. Another document that may be helpful is entitled "An Evaluation of the Costs of Stormwater Management Pond Construction and Maintenance". These two texts provide about the best information that is available on the subject.

Two additional documents that may be of interest are entitled "Financing Marine and Estuarine Programs: A Guide to Resources" and "A Methodological Approach to an Economic Analysis of the Beneficial Outcomes of Water Quality Improvements from Sewage Treatment Plant Upgrading and Combined Sewer Overflow Controls". The issue of how to finance the implementation of resource protection programs is becoming more of an item of concern as the magnitude of the needs becomes more recognized. The most common ways that states have historically addressed the resource needs is through a general appropriation by the State governments, through the use of federal funding obtained from the Environmental Protection Agency, or through permit fees. As federal spending becomes more controlled, another funding source must be identified to maintain and improve program performance.

The two most commonly considered options include impact fees on land developers and the use of user fees where everyone pays a fee based on their type of land development and the resource needs. The impact fee is a one time fee paid by a land developer which is in addition to permit fees and waiver or exemption fees. That money is used to fund staff positions that may have an indirect relationship to the regulatory program and function for watershed planning, monitoring, program administration, etc. The problem with reliance on impact fees to fund a significant portion of program implementation is the maintenance of program function during a recessionary period when the construction industry is inactive.

The method of funding that, at this time, seems most promising is the concept of user fees. The philosophy behind user fees is that everyone either contributes to nonpoint pollution problems or benefits from the implementation of control practices. The rates can be based on an individual property owners stormwater contribution using something similar to the c factor coefficient contained in the rational formula. The first item that needs to be addressed in the user approach is to determine the resource needs. That annual figure then determines the individual property owner rates which can then be paid on a quarterly or annual basis. Over 50 jurisdictions in the U.S. have already established user fee programs. Properties having a greater impervious area such as commercial properties can expect to pay significantly higher annual fees.

When estimating program costs, several points need to be considered:

1) Much of the cost of program implementation depends on the amount of development that is ongoing. The amount of development drives the regulatory aspects with respect to plan review and inspection.

2) One plan reviewer can review approximately 2 design plans per day for stormwater management and silt control.

3) Inspectors can inspect approximately 3 large sites per day and should visit each active construction site at least once every two weeks to ensure adequate site protection. Using this as a guide, the average inspector can reasonably handle a work load of approximately 30 large projects.

4) Constructed stormwater management systems should be inspected at least annually to determine the need for maintenance. As these structures become more numerous, this work load will increase as will the need for maintenance of the practices.

5) Other manpower needs must be considered depending on the aggressiveness of the desired approach. Issues such as practice monitoring, watershed studies, and administrative responsibilities must be considered as a funding component. Vehicles for inspectors can be very expensive.

6) Aggressive enforcement can offset some of the expense of program implementation. That amount of cost reduction will depend on available legal options.

The selected funding mechanism will probably involve a combination of several different methods. A permit review fee will have to be established, an impact fee may be required, there may possibly be an inspection fee, and there will have to be a general appropriation from the state legislature. The one item that generally has not been addressed adequately is the maintenance of these structures. Maintenance costs can expect to be approximately 5% of the construction costs annually. That money has generally not been set aside and large scale problems can be expected. Historically, the maintenance of these structures has been the responsibility of the land owner. Site inspections accomplished by staff in Maryland indicated that approximately 70% of the structures were not functioning as designed. Only now are the larger local jurisdictions attempting to develop a maintenance infrastructure. It is recommended that maintenance should be a public responsibility and that responsibility should be assumed from the outset. Before any widespread stormwater management program is implemented, the responsibilities for maintenance should be established and funding mechanisms implemented.

Publicity/Education Programs

Experience in the nonpoint field has indicated that the value of public education and training of impacted individuals cannot be understated. Public education results in a more support for the program from an institutional and funding standpoint. Our society relies to such a large extent on its water resources that the identification of a problem as important as water quality should be of concern to most residents.

The first step needs to be problem identification. The general public needs to become aware that there are existing water quality impacts. It should be

emphasized that these problems are a result of man's activities. Water quality data can be presented but visual evidence should also be publicized. A private organization in Maryland, the Chesapeake Bay Foundation, has a poster for sale showing a high altitude photograph of the Chesapeake Bay just following a rainfall event. The sediment plumes entering the tributaries is graphic evidence that a problem exists. People purchase these posters and hang them in their houses. There are so many ways that the public awareness process could be developed that it needs to be integrated in all aspects of program development and implementation.

On a smaller scale, displays should be developed that can be transported to various public events around the a given region. This could be a visual display that describes the nonpoint problems and local efforts to deal with those problems. This display could be taken to fairs, outdoor events, libraries, and public buildings. At the same time presentations could be given at civic type functions such as community meetings, garden clubs, and nature groups to discuss the nonpoint issues. These groups frequently are looking for speakers at their regular meetings.

The construction of demonstration projects would be another excellent opportunity to demonstrate the types of practices and strategies that are needed. These implementation projects should be located around the region where field trips could visit. Upon completion of construction, signs should be prominently placed that briefly describe the project, and the fact that it was constructed by the state or regional authority as a water pollution control project. Using a school site as a water quality project provides multiple benefits. Water quality improvement can be expected and the students receive an educational tool.

One existing demonstration project was the construction of an artificial wetland at a local school that captured the pollutants from the school parking lots. The students assisted in the planting of the wetland community, and are now engaged in water quality monitoring of toxics. They are learning the types of pollutants that are generated from an urban environment, and one strategy for reducing their movement downstream. The created wetland is functioning as an outdoor laboratory for the school's biology department.

Implementation of a regulatory program for water quality will necessitate a significant educational program for those individuals impacted by the program. The engineering community has to be educated regarding the need for the regulatory process, and the proper engineering design. This can be accomplished by the development of design standards and example situations, but seminars and workshops will also have to be a regular component. An annual event such as a conference or seminar is an excellent avenue for information dissemination. Components of this conference could include design workshops, new innovations, case studies, and general information. If all impacted groups become involved, the seminar could become a mechanism to foster communication between normally adversarial groups such as land developers and environmental groups. One seminar previously discussed that is becoming more popular in the U.S. is the contractor certification program. In addition to the educational benefit provided to the contractor, it is an excellent forum for discussion and feedback from the individuals in the field who are responsible for the construction and maintenance of the sediment and stormwater practices. A number of standard practices have been modified due to feedback from contractors.

Fostering communication between the state or regional authority and environmental groups is of vital importance. Those groups can become strong advocates of budgetary and personnel requests. In both Maryland and Delaware the States established environmental associations called Save Our Streams and Streamwatch to champion environmental water quality issues. Funding and staff support was provided to those groups until they could assume an individual identity. In Maryland Save Our Streams has become a strong independent environmental watchdog. In numerous situations they have provided needed political support for State environmental initiatives. It must be recognized that these groups are volunteer by nature and every effort must be made to fit in the average individual's off-work schedule. If established and funded adequately, these organizations may achieve a measure of independence after 5 years and they may not always agree with your efforts. Environmental groups tend to push the regulatory agencies into environmental protection programs sooner and more aggressively than the agency would have without the outside influence.

In all aspects of public education simplicity is the key. You must keep the sessions relatively short with a major emphasis on entertainment. People will only learn if you can keep their interest and too much information will only lose their interest. The same philosophy is true regarding technical sessions. Too much information in too short a time frame will lose its value and the educational process is the most important aspect of the nonpoint program. To some degree you are asking people to change a life style to reduce their impacts to the natural ecosystem. Voluntary cooperation and support is so important to the implementation of a nonpoint pollution program in such areas as waste oil disposal, lawn fertilization, and chemical disposal. A regulatory mechanism is essential in certain situations, but people must also accept and understand the need for the program.

One mechanism that should be pursued is a newsletter or publication of some sort that serves as a vehicle for communication to outside interests. There are a number of periodicals that relate to the Chesapeake Bay and the State of Delaware publishes a magazine called the "Delaware Conservationist" that is issued four times a year. This type of document can discuss results, ongoing efforts, and proposed projects and strategies. An interested party list could be established so that copies of the newsletter could be circulated.

The Role of Wetlands

The role of wetlands needs to be expanded in the nonpoint pollution field if water quantity/quality protection is to be realized. Nationwide, wetlands have been severely impacted due to rural and urban land alteration or reclamation. The replacement, improvement, and creation of wetlands, both tidal and nontidal, can mitigate adverse water quality impacts in many locations. In the Chesapeake Bay and Delaware River nutrient uptake provided the principal incentive for development of wetlands creation criteria. Wetlands can provide a major tool in the treatment of urban and rural runoff for control of nonpoint source pollution.

In addition to nutrient uptake, wetlands provide a significant benefit regarding the removal of suspended solids and trace metals. Suspended solids are sediment particles that are being transported by stormwater runoff. In ponds, suspended solids have two velocities associated with them: the horizontal flow velocity towards the pond outlet, and the vertical or settling velocity. The

object of a water quality stormwater pond is to hold the suspended solids in the pond until the settling velocity allows for sedimentation to occur. Wetland ponds, having a dense growth of aquatic vegetation, further reduce the horizontal flow velocity to improve the sedimentation process. Smaller sized suspended particles will be removed in a wetlands stormwater basin than a comparable basin having no wetlands vegetation.

Trace metals attached to the suspended solids through cation exchange and adsorption will settle out with the suspended solids during the sedimentation process. A number of processes can then occur to the trace metals by way of anaerobic and aerobic conditions. Trace metals are taken up by the roots of the wetland vegetation and translocated to other parts of the plant. The accumulation of metals in the soils and plants is not entirely clear and long-term monitoring may be necessary to determine the possible mobility of the deposited trace metals.

In addition to water quality benefits, created wetlands may have a high habitat value, and people in general relate well to the presence of wildlife. With the acceptance that stormwater controls are a necessary component of the urbanization process, habitat considerations can be easily provided, especially in urban areas where such habitat may not be abundant. In addition to providing habitat, created wetlands can provide sources of food in insects, seeds, and plant parts. These sources of food attract birds and animals with birds being the primary beneficiary.

Conclusion

The issue of nonpoint pollution control is not a question of whether there is a need, but rather when is society ready to confront that need. Problems have to be critical before they are addressed. The solutions to those problems become so much more difficult, and the ability to address those problems becomes very limited. The solutions at the critical stage tend to be primarily engineering solutions that are extremely expensive with space allocations non-existent. The time to address the problem is when the problem is recognized, not some time down the road when the solutions become more extreme. The overall costs to implement a water quality protection program are so much less than the costs to restore water quality to an earlier, higher standard. The problem is not going to just go away. The sooner it is faced, the less painful the solution will be.

It is also important to recognize that a number of years will be required to get all the necessary elements working together. A comprehensive program cannot be implemented overnight. There are many linkages with other existing programs, and those linkages must be coordinated. So often, adversarial relationships develop between program components and the overall effort is diminished. Experience has indicated that there are many growth pains associated with the development of a nonpoint program, and sorting out areas of responsibility take time. That is another reason that efforts should be started soon to address the issue. Time will be lost getting the program established, and water quality concerns will increase.

WASTE MANAGEMENT BASICS

Agricultural pollution like other types of nonpoint source pollution, is characterized by the widespread nature of its sources; it stems from literally millions of everyday activities and management decisions made by individual farmers and agricultural concerns. Individually these activities may not cause discernible environmental harm, but the aggregation of hundreds of thousands of activities over many weeks, months, or years can combine to adversely affect ground water and surface water quality, species habitats, and the quality and productivity of the soil.

The publication, Delaware Guidelines - Manure Management for Environmental Protection and its supplements were developed to encourage farmers to take voluntary action to identify and incorporate cost-effective prevention techniques into their normal farming activities. These voluntary efforts can serve two important purposes:

* Reduce the cost of complying with mandatory requirements under the new Clean Water Act and other laws;
* Reduce the need for additional regulation concerning the management of animal manures.

Voluntary actions offer farmers the advantage of maximum flexibility, and sufficient time to make economically sound changes in production and use of animal manures. Delaware has provided five years, 1990-1995, for voluntary planning and implementation of BMPs, as agreed upon by federal, state, and local agencies. Success will be measured relative to the amount of voluntary effort demonstrated during this period of time.

Nutrient/Waste Management Plans for animal-based agricultural operations are essential in preventing or reducing any impact the use of manure may have

on surface and ground water. The benefits are both economic and environmental and include

* reduced commercial fertilizer costs,
* improved soil tilth and productivity,
* protected water resources and air quality.

If they are improperly managed, wastes generated by animal agriculture can

* pollute water resources and air,
* lose fertilizer value,
* generate removal expenses instead of financial benefit,
* create a negative social and regulatory environment for agriculture.

Organic wastes originating from poultry and animal production have several potential end uses including land application, production of "biogas" for on-site heating, and off-site use of wastes as fuel or feed. The most common practice at present is land application.

A sound nutrient/waste management plan requires careful attention to detail. It uses principles from agricultural engineering, agricultural economics, animal science, and crop and soil sciences to maximize the economic value of wastes and minimize the potential for environmental damage. These plans for land application purposes have three key components: site selection, storage, and land application.

SITE SELECTION

Natural land features should be carefully considered in selecting sites for farm waste management practices, including storage facilities and disposal or utilization areas. Slopes, soils, vegetation, and proximity to streams and drainageways are traditional considerations when evaluating the effects of waste management practices on nearby surface water quality. With growing public concern about groundwater protection, land characteristics below the

soil surface also need careful consideration. You should also consider visual impact, odor, health and safety implications, as well as economic costs and benefits, when siting waste management facilities.

STORAGE

Manures and wastewaters must be properly stored to maintain good physical condition, provide ease of handling, and to avoid loss of nutrients to ground or surface waters. Storage facilities include basins, lagoons, tanks, plastic-covered stacks or windrowed piles, and permanent roofed structures with earthen or concrete floors. All facilities must have these essential features:

* sufficient capacity to store manure until proper disposal or application to cropland,
* proper location - to avoid runoff to surface waters, or percolation to groundwater,
* measures that ensure effective odor and fly control.

LAND APPLICATION

Prepare a farm-wide "nutrient budget" to determine if the available land and intended crops have the capacity to use the nutrients provided by the manures. If sufficient land is available, you should determine crop yield potential based on the soil's physical properties, and determine fertilizer requirements as indicated by a soil test.

Waste application rates should balance nutrient content in the waste with crop nutrient demands based on realistic yield goals. Nutrient composition of manures and wastewaters varies considerably. Regular analysis of wastes and soils for nitrogen, phosphorus, and potassium allows for adequate but not excessive application of manures.

Animal manures, solid and semi-solid, are usually applied with manure spreaders. Liquid manures are applied with manure spreaders and irrigation

systems or injected into the soil. In each case, you must calibrate the application equipment frequently. One of the greatest problems in land application of organic wastes is over-application caused by improperly calibrated equipment. This not only reduces the total fertilizer value of the waste, but results in excessive levels of nitrogen and phosphorus in soils, which can subsequently be lost to groundwater by leaching or to surface waters through runoff.

Application timing is critical as well. Wastes should be applied as closely as possible to the time of maximum crop nutrient uptake. Attention to nutrient/waste management basics and the best management practices outlined in Delaware Guidelines - Manure Management For Environmental Protection will help farmers integrate environmental considerations into their normal farming operations.

LEGAL AND MANAGEMENT ASPECTS OF ANIMAL MANURES

This bulletin is part of a series of publications developed for the Delaware Department of Natural Resources and Environmental Control (DNREC) by University of Delaware Cooperative Extension to assist farmers in developing sound and environmentally acceptable nutrient/waste management plans. A complete list of titles is given at the end of this section.

The publication, **Delaware Guidelines - Manure Management for Environmental Protection** and its supplements outline Best Management Practices (BMPs), or a combination of practices determined to be the most technically, economically and institutionally effective methods of preventing or reducing nonpoint source pollution derived from the production and use of animal manures. These manuals provide recommendations that can be integrated into all farm operations. These manuals should be used by farmers, DNREC, Soil Conservation Service, Delaware Cooperative Extension and others concerned with environmentally sound agricultural practices.

Delaware farmers have a long history of practicing good stewardship to conserve the state's agricultural resources. However, as farming, recreational usage, and industrial and residential development become more concentrated, the potential for environmental problems resulting from poultry and livestock farm operations increases. Preventive measures are essential. It is easier to prevent pollution or other environmental problems than to correct them after they occur.

Common sense and careful observation can often determine whether a given farm practice is likely to cause pollution or other environmental problems. Water quality will be adversely affected if manure runs into streams or drainage ditches as a result of land application, spillage, storage overflow or

deliberate dumping. Nutrients in manure applied at rates that exceed crop fertilizer requirements can leach into groundwater or be carried away with runoff water and eroded soil. Excessive manure application may also result in decreased crop yields. Such problems vary on each farm and must be handled appropriately by individual farmers.

Manure management problems often arise when poultry or livestock are added to a farm without increasing the land base. Farmers who purchase a high percentage of their livestock feed are unlikely to have sufficient land to utilize the manure safely and effectively. In general, farmers who grow all or most of the feed consumed by their animals probably have sufficient cropland for well-managed manure application.

If manure production exceeds land application requirements, arrangements should be made to move excess manure to other cropland or to use it for other purposes. The farmer is responsible for providing a manure management system that does not harm the environment. Sound management involves proper planning, design, construction, maintenance and operation of the handling system. When necessary, it may include extra storage, spare parts, backup equipment, or contingency plans for equipment breakdown or for extraordinary weather conditions.

BENEFITS OF SOUND MANURE MANAGEMENT

The reasons for developing a sound manure management program include 1) environmental benefits to Delaware, 2) economic benefits to the farmer, and 3) compliance with laws and regulations concerning environmental quality.

Manure management involves setting up an effective system to handle and utilize manure produced by poultry and livestock. All situations described in this manual involve returning the manure to cropland as part of a comprehensive crop management program, including regular soil and manure testing. If too

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much manure is being produced for available land, long-range solutions to solve this problem must be implemented.

This manual does not attempt to cover specialized systems designed to market manure or utilize it as a fuel, feed or special fertilizer. Since these systems are usually site specific, interested farmers should seek professional advise to ensure that their methods are environmentally sound.

Environmental Benefits to Delaware

In general, Delaware soils are moderately coarse-textured. They overlay groundwater aquifers from which two-thirds of the water needs of the state are withdrawn. In lower Delaware, groundwater supplies 90 percent of the water consumed by people for all uses. In addition to meeting domestic needs, most surface water (water found in lakes, streams, and leaching to the freshwater portion of our coastal estuaries) is groundwater discharge. Well-managed poultry and livestock manure can help protect this important natural resource.

Poultry and livestock manure is extremely beneficial for plant growth, improving soil structure and increasing fertility levels. If improperly handled, however, it can be an environmental hazard, resulting in runoff into surface streams and leaching to groundwater. Manure contamination can increase nitrate levels in groundwater and cause bacterial contamination, fish kills and odors. Responsible farmers manage manure to gain maximum benefits with minimal harm to the environment.

Economic Benefits to Farmers

When applied in the proper amounts at the appropriate times, poultry and livestock manures can provide some, if not all, of the nutrients required for many crops grown on Delaware farms. A manure-handling system also can improve labor and equipment utilization. Manure usually is applied to cropland owned or controlled by the poultry or livestock owner. In some situations, the owner

may choose to sell manure to others for use on cropland, gardens and nurseries. In certain situations, manure may also be recycled as a fuel substitute or additive or as part of a refeeding program.

Regardless of where and how manure is used, it has the potential for improving crop production and soil productivity. A 50-cow dairy herd and associated young stock produce approximately 1400 tons of manure annually. Depending on storage and handling methods, this manure contains approximately 15,000 pounds of nitrogen, 6,000 pounds of phosphate and 12,000 pounds of potash. These nutrients are best utilized as a fertilizer for growing plants. The organic matter and other trace elements also may improve soils productivity substantially. Farmers who successfully manage this quantity of material to gain maximum crop production save a considerable amount of money on purchased fertilizer. Those who do not manage this nutrient supply efficiently reduce crop production levels, increase fertilizer bills and may cause pollution. In many cases, excess nutrients pollute the farm's own water supply. They also may cause odor and air-pollution problems.

COMPLIANCE WITH LAWS AND REGULATIONS

With the promulgation of the Water Quality Act of 1987, the federal government required each state to develop programs to control nonpoint sources of pollution of both surface and groundwaters. Nonpoint source pollution (NPSP) has been defined as "pollution caused by diffused sources" and as such:

> "is associated with agricultural, silvicultural, urban runoff, runoff from construction activities, etc. Such pollution results in the human-induced alteration of the chemical, physical, biological and radiological integrity of water. In practice terms, nonpoint source pollution does not result from a discharge at a specific, single location (such as a pipe) but generally results from land runoff,

precipitation, atmospheric disposition, or percolation. Pollution from nonpoint sources occurs when the rate at which pollutant materials entering waterbodies or groundwater exceeds natural levels." (U. S. Environmental Protection Agency, 1987)

On August 4, 1988, the State of Delaware Department of Natural Resource and Environmental Control issued its Nonpoint Source Pollution Management Program as required by the Water Quality Act of 1987. It is the purpose of the NPSP Management Program to carry out its program while maintaining a healthy agricultural industry in Delaware.

The goals of the Delaware NPSP Management Program to address animal holding/management areas are as follows;

1. To reduce nutrient loadings to both surface and groundwater from existing animal holding/management areas.
2. After identifying the impacts of animal holding/management areas, to establish standards for new facilities to protect existing water quality.
3. To implement demonstration projects to show resource management systems for poultry operations including conservation practices for animal confinement facilities, manure management, fertilizer management and farmstead operations to reduce NPSP.
4. To establish an effective educational and technical-assistance delivery system to help operators of animal holding/management areas address NPSP.

Delaware's NPSP Management Program urges farmers to develop and implement a comprehensive nutrient/waste management plan based upon sound conservation practices and management measures. Planning and Implementation of BMPs are accomplished with the assistance of the Soil Conservation Service in accordance

with designs and specifications outlined in the USDA Soil Conservation Service Technical Guides. In addition, the Cooperative Extension System provides education on conservation and management practices through Cooperative Extension specialists and agents.

Best Management Practices must be properly applied and maintained. it is intended that proper installation of BMPs will achieve water quality standards. Therefore, water quality standards are to be used to measure the effectiveness of BMPs.

BMP recommendations will vary widely, even on an individual farm, because site, environmental and economic factors result in numerous management options. Due to the variety of factors to consider in manure management, it is nearly impossible to recommend any single best management practice. Therefore, a process has been established that sets a precedent for implementation of BMPs as they relate to water quality standards. This process includes:

1) Modifying and improving the performance of BMPs based on site-specific conditions. BMPs may be used as performance standards for proposed NPS management programs.
2) Monitoring to ensure practices are correctly designed, applied and effective in meeting quality standards.
3) Adjusting BMPs and/or water quality standards if desired level of protection is unobtainable.

In general, regulations have not been adopted in Delaware addressing the management of animal wastes. However, specific components of animal manure storage facilities will require a permit from the DNREC. Information and technical assistance is available for nutrient/waste management planning and implementation through the Soil Conservation Service, Cooperative Extension and the DNREC.

A farmer who chooses to design or construct a manure storage or land application system using criteria not approved by the Soil Conservation Service and/or the DNREC may be subject to the permitting process.

Farmers are obligated by federal and state law to manage animals properly so that manure does not pollute surface or ground water. Concentrated animal feeding operations are point sources subject to the National Pollutant Discharge Elimination System (NPDES) program, pursuant to the Clean Water Act.

Federal regulations provide that NPDES permits can be required on a case-by-case basis. Voluntary action that results in planning and implementation of a nutrient/waste management plan on a farm to reduce and/or prevent impacts on surface or ground water will pre-empt the NPDES permitting process.

Information on what qualifies as a concentrated feeding operation is available upon request from the DNREC.

Under the Delaware Environmental Protection Act, all activities that cause or contribute to the discharge of a pollutant into any surface or groundwater are subject to the permitting process.

In addition to the Delaware Environmental Protection Act (7 Del. C., Chapter 60), various local, state and federal laws also may apply to manure handling, including the following:

Water Quality Act

Federal Clean Water Act

Delaware Regulations Governing the Control of Water Pollution

Delaware Guidance and Regulations Governing the Land Application of Wastes

Delaware Water Quality Standards for Streams

Delaware Regulations Governing Solid Waste

1971 Delaware Soil Conditioner and Fertilizer Act

Local Ordinances

CLEAN WATER ACT REAUTHORIZATION

NONPOINT SOURCE POLLUTION CONTROL

TESTIMONY OF

ED NEAFSEY

DIRECTOR OF ENFORCEMENT POLICY

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO THE

SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT

OF THE

HOUSE COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION

MAY 1, 1991

WASHINGTON, DC

Good morning. I am Ed Neafsey, Director of Enforcement Policy for the New Jersey Department of Environmental Protection. It is an honor to have the opportunity to testify before you and give you New Jersey's perspective of the nonpoint source program authorized by Section 319 of the Clean Water Act. I would like to begin by briefly discussing the significance of nonpoint source pollution in our state.

According to our 1990 State Water Quality Inventory Report, nonpoint source pollution is a major cause for not achieving fishable and swimmable clean water goals in 70% of our assessed streams and rivers, 24% of our estuaries and 39% of our ocean waters. In addition, seasonal monitoring of swimming beaches reveals that nonpoint source pollution has been the cause of greater than 70% of all beach closings in New Jersey. Clearly, nonpoint source pollution threatens the water resources of the state as well as our economy and way of life.

However, a significant information gap exists in New Jersey with regard to the relationship between the general impact of nonpoint source pollution and the specific causes and effects. As the most densely populated state, New Jersey must focus on urban and suburban nonpoint sources. Relative to other source categories, there has been very limited federal assistance for problem assessment of urban/suburban nonpoint pollution sources.

Historically, nonpoint source activities have focussed on agricultural concerns. Due to this focus, large agricultural states have been identifying nonpoint pollution sources and water quality problems with federal funding available through other programs. Under present

federal policy, funding allocations are weighted in favor of these agriculture-based programs, rather than urban and suburban-based programs. Shifting this balance would enable urbanized states to gain equal footing. Assistance for data collection and problem assessment is seriously lacking under Section 319 and must be provided if the program is expected to succeed.

Presently, Section 319 mandates a four year program with implementation of strategies within priority watersheds identified by the state. Such a time schedule is unrealistic even when the pollution problems and sources are well understood. In addition, although over $400 million was authorized by Congress in 1987, only a small fraction of that amount has been available to states to implement Section 319 during the last two years. Nevertheless, New Jersey, through many state-funded programs, is committed toward this goal of controlling nonpoint source pollution. At the present time, state funding for these programs far exceeds federal contributions. However, even with the state contribution, the total funds are clearly inadequate to provide nonpoint source pollution implementation at the level called for under the Clean Water Act.

Under the New Jersey Sewage Infrastructure Improvement Act, the State has made available $1.5 million thus far and will provide $5.5 million more this year to address stormwater discharges within four coastal counties. In addition, approximately $7 million has been appropriated to address combined sewer overflows statewide. The primary intent of the law is to protect coastal water quality by removing bacteria from stormwater systems as well as abating nonpoint sources of

pollution. Two million additional dollars appropriated under this Act was also utilized to support "Operation Clean Shores" where low-security prisoners serving as a work force removed 9,5 million pounds of debris in the NY-NJ Harbor area last year.

In 1990, the New Jersey Stormwater and Combined Sewer Overflow Abatement Bond Act was overwhelmingly approved. Through this Act, $50 million dollars will be available as grants and loans to local governments for planning, design and construction of local stormwater and combined sewer overflow projects. The State is currently working on rules to distribute the funds and hope to have on-going projects by late 1992. Although encouraging, these two appropriations just begin to address the problems of nonpoint source of pollution.

New Jersey also has in place, a number of watershed management programs focusing on nonpoint source pollution, including the Navesink River Water Quality Improvement Project, the Barnegat Bay Study and the Great Swamp Initiative. At present, these programs are fine-tuning pollutant source identification and are encouraging future implementation on a local level through source control and education.

In the meantime, New Jersey is trying to fill the present need for implementable solutions. A Nonpoint Source and Stormwater Control Best Management Practices Manual is being drafted. Also, ground water protection best management practices have been produced. However, through these programs, it has become even more apparent that precise, technical information is needed on the performance of present proven technologies and the development of new, innovative pollution reduction

methods. This is especially true when tackling the problems associated with existing development which is viewed as the most difficult nonpoint source problem facing New Jersey. In this aspect, more technical guidance from the federal government will be welcomed.

In terms of nonpoint source impacts from new development, the New Jersey Stormwater Act which was passed in 1981, provided funding to municipalities to prepare and adopt stormwater management plans and ordinances. Also, New Jersey has provided more than $1,000,000 to fund county and university demonstration projects aimed at implementing comprehensive watershed management projects.

Progress has also been achieved in the area of ground water protection. New Jersey has an approved ground water strategy and has released a Well Head Protection Plan. A generic plan for pesticides in ground water is being developed in New Jersey in cooperation with the federal Soil Conservation Service. New Jersey also has strong programs to address ground water contamination by underground storage tanks and hazardous wastes. As with surface water, the need for more research is critical to successfully implement ground water protection programs. In particular, the fate and transport of ground water pollutants in various aquifers needs to be better explored. Concise guidance documents are also needed to direct local governments in ground water protection.

To protect surface water drinking supplies, the New Jersey State Legislature required the Department of Environmental Protection to investigate the feasibility of buffer zones surrounding drinking water reservoirs. The Department submitted a report recommending the

application of multi-zone buffers throughout the watersheds associated with public water supply reservoirs, intakes and tributaries. The multi-zone buffer concept would incorporate a limited land-use management approach with a more widespread nonpoint source pollution control approach by establishing layers of zones with differing requirements for controlling nonpoint source pollution. Legislation has been introduced to implement these recommendations.

As New Jersey moves forward in its programs, the need for coordination between agencies and programs of varying authority has become evident. Recently, EPA promulgated regulations for controlling stormwater discharges under 402(p) of the Clean Water Act. As New Jersey has been developing programs to satisfy the intent of Sections 319 and 402(p), it has realized that there is a considerable overlap between the activities involved with stormwater permitting and nonpoint source management. An opportunity exists to provide for better coordination between the activities implemented under these two sections. This is extremely important for urbanized states like New Jersey where urban runoff is the principal concern for both nonpoint source management and stormwater control. Although the sources of pollutants are nonpoint, the conveyance through a stormwater system is considered a point discharge and regulated as such. At present, EPA has interpreted the Act to treat Section 402(p) and Section 319 as separate programs with no overlap or coordination of effort. It is our experience that this is not a practical approach for New Jersey. We therefore recommend that these programs be more closely linked.

In this brief testimony, I have described some of New Jersey's programs for nonpoint source pollution and have voiced some of the needs and frustrations under the present system. In addition to this testimony, I will be submitting other documents reflecting New Jersey's programs and concerns.

To summarize, more monitoring, research and technical development to address urban and suburban sources of nonpoint pollution are desperately needed. Such information is fundamental to begin the planning and implementation phases of sound programs. Since the adoption of Section 319 in 1987, our understanding of nonpoint source pollution and its complexity has slowly broadened. It is evident that control of nonpoint source pollution will take many years and involve changes in lifestyle and attitudes as well as government intervention. New Jersey has demonstrated its commitment to improving water quality and reducing nonpoint source pollution. It is time for Congress to reaffirm its commitment through reauthorization and amendments that will both support and coordinate all state's efforts. Therefore, New Jersey calls upon Congress to provide a long-term and substantial funding base for both nonpoint source pollution and stormwater control so we can achieve the original goals of the Clean Water Act calling for a return of fishable and swimmable waters throughout the country.

TESTIMONY OF
MARTHA G. PROTHRO
DEPUTY ASSISTANT ADMINISTRATOR
OFFICE OF WATER
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT
OF THE
COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION
U.S. HOUSE OF REPRESENTATIVES

May 1, 1991

Good morning, Mr. Chairman and Members of the Subcommittee. I am Martha Prothro, the Deputy Assistant Administrator for Water at the U.S. Environmental Protection Agency (EPA). I am pleased to be here with you today in response to your request to discuss the General Accounting Office's (GAO) October 1990 report, *Greater EPA Leadership Needed to Reduce Nonpoint Source Pollution.*

I want to commend GAO for its comprehensive report identifying many of the issues and barriers facing EPA, other Federal agencies, State and local governments, and others in our efforts to prevent and improve management of nonpoint sources (NPS) of water pollution. As GAO correctly points out, a series of reports by the Science Advisory Board (SAB) have documented that NPS pollution causes or contributes to a relatively large percentage of impaired waterways. The most recent SAB Report, in fact, cites nonpoint source pollution as a leading cause of habitat alteration, which, in turn, is the principal cause of losses of aquatic fish and wildlife populations through: eutrophication, siltation, and loss of spawning habitat due to sediment; reduction in water transparency leading to loss of submerged aquatic

vegetation; bioconcentration of toxics in fish (pesticides, metals), and acidification.

The SAB Report says that EPA must do a better job of setting its many competing priorities, based on risk to both human health and to ecological risk, if the Agency is to be successful in its mission. In the words of the 1990 SAB report *Reducing Risk*,

> there are heavy costs involved if society fails to set environmental priorities based on risk. If finite resources are expended on lower priority problems at the expense of high priority risks, then society will face needlessly high risk.

EPA agrees with this position, and supports a decision-making process based on reducing risk to the extent practicable. Nonpoint source control efforts, therefore, must continue to receive priority attention in our programs and budgets.

While GAO and others would like us to move faster on funding NPS programs, EPA has made measurable progress over the last several years in increasing our NPS commitments. Under Section 319, resources were requested and appropriated to fund nonpoint source management activities in FY 1991, and we are requesting increased Section 319 funds for FY 1992. The GAO Report notes that "EPA's budget priorities in water pollution control are oriented overwhelmingly toward point source pollution problems." This is largely due to the long-standing EPA statutory mandates in the Clean Water Act to address point sources. Our success in addressing point sources now suggests the need for EPA and the States to increase our levels of staff support for the nonpoint source program in light of the importance of nonpoint source pollution as a primary cause of the nation's remaining water quality problems. In

addition, we are increasingly using other EPA programs and leveraging resources of other Federal agencies to augment Section 319 funding to address NPS pollution.

For example, EPA's Chesapeake Bay and Great Lakes programs focus many of their resources on determining the nature and extent of NPS pollution, and supporting State and local implementation activities for their impaired and threatened watersheds. In addition, the 17 management conferences in the National Estuary Program provide EPA help to States and localities to integrate NPS planning into their comprehensive plans to address near coastal water problems. Furthermore, as part of the 1990 Coastal Zone Management Act Amendments, EPA is working with the National Oceanic and Atmospheric Administration (NOAA) to develop guidance on NPS management measures that shall serve as the basis for management measures adopted by the States and local governments as part of their coastal NPS Pollution Control Programs. We expect the combined efforts will produce measurable improvement in the nation's coastal and estuarine areas.

While we are placing more emphasis on preventing NPS pollution, we must also maintain our water quality successes in point source controls by continuing investments in those programs. As GAO rightfully acknowledges, nonpoint source pollution problems are now more visible in large part because EPA and the States have focused their attention and resources over the last 20 years on controlling point sources of water pollution. In addition, some contributors to water quality impairment that have traditionally been regarded as nonpoint sources are, in fact, point sources and thus may be subject to permitting and enforcement provisions of the National

Pollutant Discharge Elimination System. Examples are stormwater discharges and combined sewer overflows. Thus, continuing our investment in point source programs is essential to maintaining progress achieved thus far and addressing some of the nontraditional sources of pollutants that continue to cause impairment of water quality, and, habitat and species destruction.

In its report, GAO indicated that EPA cannot solve NPS problems alone, given the magnitude and diffuse nature of the problem coupled with basic State and local land use prerogatives. In developing and publishing our *Nonpoint Sources: Agenda for the Future* (January 1989), we reaffirmed EPA's role in NPS under the Clean Water Act: to help State and local governments overcome barriers to successful implementation of NPS measures. Our NPS Agenda was far-reaching and ambitious, and was meant to challenge us, other Federal agencies, State and local governments, and others to expand our approaches to address pressing NPS needs.

While we have made progress, we all know that much more remains to be done under our NPS Agenda. GAO makes four specific and appropriate recommendations to guide EPA in its efforts to fulfill the Agenda's goals. I would like to briefly summarize the actions we now are taking to accelerate our NPS efforts, consistent with these recommendations.

First, with regard to the GAO recommendation that EPA should do more to resolve problems that arise from policy conflicts between Federal agencies and water quality goals, EPA is continuing its efforts to coordinate with its sister Federal agencies and is encountering growing cooperation. Currently, we are working very

effectively with the U.S. Department of Agriculture to assure that the President's Water Quality Initiative demonstrates meaningful and measurable environmental projects that can be models for landowners to assist them in reducing agricultural nonpoint source pollution, which, according to EPA's 1988 §305(b) Report accounts for 55% of the impaired river miles assessed as well as 58% of lake acres assessed, and may be the leading cause of aquatic habitat destruction. We have also recently established a staff-level water quality working group with the U.S. Forest Service to address issues related to forest resource management and water quality. We are continuing our active involvement with the U.S. Geological Survey on its National Water Quality Assessment program, which will be an important contributor to evaluating the water quality problems from agriculture and other nonpoint sources and in measuring the results of our NPS prevention and control measures. Finally, we are working very successfully with the National Oceanic and Atmospheric Administration (NOAA) to carry out our mutual responsibilities in implementing the new State coastal NPS control programs recently required by the Coastal Zone Management Act (CZMA) amendments enacted in November 1990. All in all, we feel that, while there is much more we need to do in cooperation with other Federal agencies, we have made great strides in this area and will continue to expand and strengthen our Federal alliance.

The second major GAO recommendation is that EPA develop NPS pollution criteria that will enable the States to develop and implement sound, defensible nonpoint source water quality standards. We now have efforts underway to help States adopt appropriate, effective biological criteria into their water quality standards.

Biological criteria help describe the reference biological integrity of aquatic communities, and are expected to be particularly useful in identifying, preventing, and controlling nonpoint source pollution. In early 1990, EPA made it a priority that States adopt narrative biological criteria in State water quality standards by 1993. In the meantime, EPA will pursue other NPS-related criteria activities, including development and publication of technical guidance for both biological and sediment criteria. EPA strongly supports GAO's recommendation, and will continue to place very high priority on producing the scientific and technical tools States need to effectively deal with NPS pollution.

The third GAO recommendation is that EPA develop monitoring techniques to help States and local governments determine the nature and extent of their NPS pollution problems, and to measure the effectiveness of corrective actions. Traditional instream chemical analyses are not sufficient to address NPS monitoring needs, and we have worked to develop rapid bioassessment techniques for small- and medium-sized streams. We are now expanding these techniques to address estuarine environments as well. Again, we agree with the GAO recommendation, we are making progress in this area, and we will continue to provide new tools and technologies to meet the needs of States and local governments.

In addition to our efforts at EPA, we have strengthened our requirements and guidance for NPS monitoring in all State watershed implementation projects we fund under Section 319. And, we will continue to encourage citizen volunteer monitoring efforts to augment government efforts, as these are particularly cost-effective in

identifying local NPS (and other) water quality problems needing immediate attention. Citizen monitoring is also a very effective way to engage the public in caring for its own water resources.

GAO's fourth recommendation is that we increase our education efforts to build public support for actions to reduce the adverse public health and ecological impacts of NPS pollution. We have already taken several major steps to improve general public outreach. For example, we are publishing eight issues of "NPS News-Notes" annually (5,000 copies per issue), which is rapidly disseminating the information and experiences among the entire NPS community of stakeholders. We are also establishing a national electronic bulletin board to more effectively and rapidly transfer successful NPS management approaches and ideas across the U.S. And, in addition to EPA's efforts, most State NPS programs are developing and implementing their own public education programs and activities with their Section 319 grants. While we agree with GAO's recommendations, we see our role as that of a catalyst, empowering States and local governments to develop their own education programs and outreach campaigns that address their own problems and constituencies.

In conclusion, I would like to make some general observations about the future of the NPS program. Because of the diversity of the NPS problem and the links to activities that occur on land, preventing and controlling NPS pollution is both complex and challenging. For these reasons, the Agency sees a need for creative, locally derived and locally implemented site-specific solutions to NPS pollution management. Recognizing the need for more innovative approaches, the Office of Water has hosted

symposia with leading scientific and economic experts to promote discussion on the needs of our water programs. Symposia have been held on "The Risks to Clean Water" and the "The Costs of Clean Water," and, through these discussions, a number of ideas have been generated that deserve consideration as we contemplate the future of the program.

First, we think economic and market-based approaches, such as trading of point and nonpoint source discharge credits, may hold much promise for preventing and controlling NPS pollution. This has already been applied in several smaller projects, and we are examining its applicability on a broader basis.

Second, last year's amendments to the Coastal Zone Management Act contain an interesting approach to nonpoint source pollution control. In a special effort to address nonpoint source problems in coastal areas, those amendments require States participating in the coastal zone management program to adopt management measures implementing nonpoint source pollution controls designed to restore and protect the coastal zones. We will be examining the results of such a technology-based approach to nonpoint source pollution control over the long run to see what promise this approach may hold for application to other situations.

Third, we see a need for leadership by Federal agencies in addressing NPS pollution on Federal lands and as a result of activities funded with Federal dollars. We believe the Federal government should set an example by routinely implementing effective best management practices on Federal lands.

These are just a few of the more innovative approaches under discussion to further protect the nation's water resources. Thank you for this opportunity to discuss EPA's NPS efforts in the context of the GAO report. I would be happy to address any questions you may have at this time.

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United States General Accounting Office

GAO

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WATER POLLUTION

Greater EPA Leadership Needed to Reduce Nonpoint Source Pollution

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The Honorable Glenn M. Anderson
Chairman, Subcommittee on Investigations
and Oversight
Committee on Public Works and Transportation
House of Representatives

The Honorable Bob McEwen
Ranking Minority Member, Subcommittee on
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Committee on Public Works and Transportation
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As requested by the former Chairman and former Ranking Minority Member, we have reviewed whether federal programs and activities are inhibiting state and local efforts to control nonpoint source pollution. Specifically, this report discusses (1) the barriers that may be inhibiting state and local nonpoint control efforts, noting in particular federal programs that may be contributing to the problem, and (2) what actions EPA can take to better focus federal efforts on reducing nonpoint source pollution.

As arranged with your offices, unless you publicly announce its contents earlier, we will make no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to other appropriate congressional committees; the Administrator, EPA; and the Director, Office of Management and Budget. We will also make copies available to other interested parties.

This work was performed under the direction of Richard L. Hembra, Director, Environmental Protection Issues, who may be reached at (202) 275-6111. Other major contributors to this report are listed in appendix I.

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Executive Summary

Purpose

Although significant efforts have been made to restore the quality of the nation's waters since the Clean Water Act's passage in 1972, many are still heavily polluted. Moreover, increased concern has developed in recent years over the toxicity and potential health effects of many of the contaminants being detected in these waters. According to the Environmental Protection Agency (EPA), the nation's remaining water quality problems are largely attributable to pollution from "nonpoint" sources—diffuse sources of pollution rather than pollutants discharged from a single, specific "point" source.

Concerned about the impacts of nonpoint source pollution and the prospect that federal programs may be inadvertently exacerbating the problem, the former Chairman and former Ranking Minority Member of the Subcommittee on Investigations and Oversight, House Committee on Public Works and Transportation, asked GAO to determine (1) what barriers may be inhibiting state and local efforts to control nonpoint source pollution, noting in particular federal programs that may be contributing to the problem, and (2) what actions EPA can take to improve the focus of federal efforts on reducing nonpoint source pollution problems.

Background

Nonpoint source pollution is the by-product of a variety of land use practices, including farming, timber harvesting, mining, and construction. It also results when rain washes pollutants in urban areas into sewer systems and storm drains (urban runoff). Agriculture accounts for the largest share of the nation's nonpoint source pollution, affecting about 50 to 70 percent of assessed waters (evaluated for water quality) through soil erosion from croplands and overgrazing, and runoff of pesticides and fertilizers.

Given the diversity of nonpoint source pollution and its relationship to local land uses, the Congress historically has been reluctant to allow EPA to deal directly with the problem. While the Water Quality Act of 1987 left primary responsibility for nonpoint source pollution control with the states, it expanded EPA's role by requiring the agency to review and approve (1) state assessments of the extent to which nonpoint sources cause water quality problems and (2) state programs designed to address these problems. In addition, EPA has acknowledged its own responsibility in its 1989 Nonpoint Sources: Agenda for the Future "to provide strong leadership for the national nonpoint source pollution control program and help states and local governments overcome barriers to successful implementation of nonpoint source measures."

Results in Brief

Among the problems GAO identified as significantly affecting state and local efforts to control nonpoint source pollution are the inherent conflicts between some federal agencies' policies and states' water quality goals. A prime example of the problem is the U.S. Department of Agriculture's (USDA) farm commodity programs, which indirectly contribute to nonpoint source water pollution through policies that encourage use of chemicals and pesticides. Among the other problems confronting state and local efforts to control nonpoint source pollution are (1) insufficient monitoring data on both the scope and impacts of the problem and on the effectiveness of potential solutions and (2) political sensitivities in controlling local land uses that indirectly cause water pollution.

In 1989, EPA outlined an ambitious 5-year agenda to focus the agency's efforts to deal with many of these problems. The agenda identified, for example, ways to improve federal coordination, help meet state and local information needs, and help state and local governments deal with sensitive land use issues. Nevertheless, GAO concludes that EPA's agenda will remain largely unfulfilled if the agency stays on its present course. Resource constraints are an underlying problem, as they are in many environmental programs. However, in the case of nonpoint source pollution, resource constraints may also reflect inappropriate allocation of available funds among the agency's point source and nonpoint source pollution control programs.

Principal Findings

Barriers to Controlling Nonpoint Source Pollution

In its report on alternative agriculture (GAO/PEMD-90-12, Feb. 16, 1990), GAO found that USDA's farm programs reinforce the use of conventional farming practices and that many of these practices contribute to soil erosion and water pollution. A major problem involves the specialization in program crops year after year, which the farm programs encourage by basing program benefits on historical crop production levels. Over time, this practice depletes the soil and leads to pest problems which, in turn, may lead to a greater need for agricultural chemicals. USDA recently undertook a Water Quality Initiative to better understand the water quality impacts of some of its farm programs, but, as reported in a 1990 GAO report on USDA's water quality program (GAO/RCED-90-162, July 23, 1990), further efforts are needed to integrate water quality concerns into agency operations.

GAO found that other key barriers impeding state and local efforts to control nonpoint source pollution may not be directly attributable to federal activities. For example, vital monitoring data are missing on both the scope and impacts of the problem, and on the effectiveness of potential solutions. Without sufficient information on scope and impacts, it may be difficult for public officials to convince landowners of the need for action and to target resources toward the most serious problems.

Although regulatory restrictions are often needed against harmful land use practices to effectively cope with the problem, GAO found that political sensitivity over land use regulation remains a formidable barrier to dealing with nonpoint source pollution. Nevertheless, an increased openness has emerged at all levels of government to confront such issues. GAO identified a number of innovative land use programs and activities to address nonpoint source pollution, particularly at the state and local levels. For example, Wisconsin's "Bad Actors" law allows the state to regulate polluting farms when owners refuse to cooperate with voluntary programs. GAO noted that land use requirements are more likely to be successfully applied when the public is better educated about the risks the problem poses to their health and the environment.

Shift in Priorities Could Help EPA Implement Its Agenda

EPA's Nonpoint Sources: Agenda for the Future acknowledged the seriousness of these barriers in coping with nonpoint source pollution and presented an ambitious plan for EPA to deal with them in fiscal years 1989 through 1993. It calls for EPA to (1) work with USDA and other agencies to better integrate water quality concerns into USDA's and other agencies' programs, (2) develop the technical information states need to conduct monitoring programs and develop water quality standards, and (3) conduct activities to raise public awareness about nonpoint source pollution and thereby garner public support for land use regulations. In each case, however, EPA officials told GAO that resource constraints have significantly inhibited the agency's progress in implementing its agenda. For example, EPA officials told GAO that an EPA-sponsored interagency task force on nonpoint source pollution has not met since October 1988 because EPA's limited nonpoint source pollution staff have had to devote their attention largely to reviewing state assessments and management plans and nonpoint source pollution grant applications.

A key contributing factor to these resource constraints is that available funds are overwhelmingly oriented toward point source control activities rather than nonpoint source. However, the agency's own analysis of

comparative risks posed by alternative pollution problems suggests that nonpoint source water pollution poses a level of health risk comparable with that presented by point sources and substantially more serious ecological risks. The Director, EPA's Office of Water Regulations and Standards, explained that, among other factors, the agency's budgetary priorities reflect statutory mandates that place greater emphasis on programs to control point source pollution rather than nonpoint source pollution.

GAO believes that while EPA cannot set its own priorities without regard to congressional mandates, it is incumbent upon EPA, as the nation's lead environmental organization, to try to influence its priorities according to its assessment of relative environmental risk. Such a reorientation need not result in a "wholesale revision" of the agency's budget in line with perceived environmental risk. Some shift in priorities, however, could go a long way toward allowing EPA to implement its agenda and thereby assist state and local nonpoint source pollution control programs.

Recommendations

GAO recommends that the Administrator, EPA, establish funding priorities among its water quality programs that will allow the agency to pursue key objectives of an effective nonpoint source agenda that have heretofore made little progress under existing funding constraints. Other recommendations to further EPA's chances of success in implementing its nonpoint source pollution agenda are included in chapter 4.

Matter for Congressional Consideration

In light of (1) the importance of nonpoint source pollution as a primary cause of the nation's remaining water quality problems and (2) the overwhelming emphasis of EPA resources devoted to point source programs, the Congress may wish to consider allocating EPA's water quality funding during the fiscal year 1992 budget process to provide greater emphasis on controlling nonpoint source pollution.

Agency Comments

GAO discussed its findings with EPA officials, who generally agreed with the information presented, and has included their comments where appropriate. However, as agreed, GAO did not obtain official EPA comments on a draft of this report.

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Abbreviations

CRP	Conservation Reserve Program
EPA	Environmental Protection Agency
USDA	U.S. Department of Agriculture

Chapter 1

Introduction

Significant efforts have been made to clean up the nation's waters since the Congress enacted the Federal Water Pollution Control Act Amendments of 1972, known as the Clean Water Act.[1] For example, through 1988 the federal government had spent about $48 billion to assist in constructing municipal sewage treatment plants under the Environmental Protection Agency's (EPA) Construction Grants Program. While EPA reports that these investments and other programs have made progress in achieving the goals of the act, states continue to identify significant portions of waterways that are still not fit for designated uses such as fishing and swimming. Moreover, concern has increased in recent years over the toxicity and potential health effects of many of the pollutants being detected in these waters.

According to EPA's National Water Quality Inventory: 1986 Report to Congress, the nation's remaining water quality problems are largely attributable to pollution from nonpoint sources. EPA defines nonpoint source water pollution as diffuse pollution resulting from land runoff, precipitation, atmospheric deposition, drainage, or seepage, rather than a pollutant discharge from a specific, single location. It notes that 76 percent of impaired acres of lake water, 65 percent of impaired stream miles, and 45 percent of impaired estuarine square miles are affected by nonpoint source pollution.

Types of Nonpoint Sources of Pollution

EPA groups the primary sources of nonpoint source pollution into the following categories: agriculture, urban runoff, hydromodification, resource extraction, silviculture, construction, and land disposal.

- Agriculture. About 50 to 70 percent of the assessed surface waters[2] are adversely affected by agricultural nonpoint source pollution, which stems from soil erosion from cropland and overgrazing, and from pesticide and fertilizer application.
- Urban runoff. About 5 to 15 percent of assessed surface waters are harmed by pollution from streets, residential neighborhoods, industrial sites, and parking lots. Urban runoff often contains nutrients and toxic and oxygen-demanding materials, and causes a higher-than-normal water temperature.
- Hydromodification. About 5 to 15 percent of assessed surface waters are impacted when the drainage, flow, or quantity of available water is

[1] The Clean Water Act was subsequently amended in 1977, 1981, and 1987.

[2] Assessed surface waters are those that have been monitored or otherwise evaluated for impacts of nonpoint source pollution.

changed by stream channelization, reservoir construction, flood prevention, or lake drainage. When water flow patterns are changed, sediment deposits increase and habitat is altered.

- Resource extraction. About 1 to 10 percent of assessed surface waters are affected by pollution from past practices such as abandoned mines, improperly sealed wells, and mining waste piles.[3]
- Silviculture. About 1 to 5 percent of assessed surface waters are affected by pollution from forestry operations, such as timber cutting. Problems include sedimentation and habitat alteration. Logging roads were identified as being a particular concern.
- Construction. About 1 to 5 percent of assessed surface waters are harmed by construction practices. Pollution from construction activities is localized and periodic. Land development and highway construction can cause sediment and toxic material to enter surface water and alter habitats.
- Land disposal. About 1 to 5 percent of assessed surface waters are impacted by land disposal activities—leakage from septic tanks and land application of sewage sludge.

In addition to the initial contamination, nonpoint source pollution can have longer-lasting impacts. For example, a heavy rain can wash tons of soil off a field, and the material can either scour out a stream bed or settle out and cover the gravel used by fish to spawn. Long after the water clears up, use of the stream for fish production may be reduced. Similarly, when trees and bushes are cut next to stream banks, the debris falling into the stream or washing into the water will initially degrade the water. A longer-term problem, however, may be caused by the higher water temperatures resulting from a lack of shade. In time, these temperatures can make the stream a less desirable habitat for fish and other animals, or may make it totally uninhabitable.

The Link Between Nonpoint Source Pollution and Alternative Land Uses

The way individuals use land can substantially affect the amount of nonpoint source pollution runoff. For example, even though some soil naturally erodes from undisturbed land, the amount of erosion can increase manyfold if the trees are cut or the land is farmed. In addition, if the land is used for housing or urban development, erosion from land clearing and excavation during construction can increase tremendously. Table 1.1 shows the variation in how different land uses can affect sediment runoff.

[3]Water pollution from active mines is considered point source pollution and is controlled under EPA's National Pollutant Discharge Elimination System.

Table 1.1: Impacts of Alternative Land Uses on Soil Erosion Rates

Type of activity	Tons of soil eroded per acre per year
Mature, undisturbed forest	<1
Farming	5–14
Intensive logging	>100
Construction	50–1,400

Source: Report to the Congress: Nonpoint Source Pollution in the U.S. (Washington, D.C.: EPA, Jan 1984)

Land use actions can also cause toxic pollution. For example, heavy pesticide use in farming has resulted in the runoff of toxic pollutants, and mining in sensitive land areas has produced leaching of heavy metals and acid mine drainage. These problems have resulted in substantial degradation of some streams, rivers, lakes, estuaries and groundwater.

To control such excessive sediment and toxic runoff, government can take a variety of measures—from voluntary efforts to encourage environmentally sound land use practices among private individuals and organizations to regulatory restrictions on harmful activities. However, land use restrictions and controls are sensitive political issues. Although states have authority to control land use, land use controls tend to be considered a local government tool. The federal government has used a voluntary cost-sharing approach to encourage improved land use actions, particularly with regard to federal efforts to control soil erosion.

Because of this political sensitivity, coupled with the decentralized nature of the problem, the Congress has been reluctant to allow the federal government to deal with nonpoint source pollution. The 1972 Clean Water Act, for example, required state and local agencies with jurisdiction in areas having severe water quality problems to identify the nature, scope, and extent of nonpoint source pollution, as well as ways to control it. However, the act did not provide any funds for implementing nonpoint source controls, comprehensive requirements for their use, or direct authority for EPA to regulate nonpoint sources.

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States Retain Primary Role for Nonpoint Source Pollution Under Water Quality Act of 1987

The Congress expanded EPA's role somewhat through the Water Quality Act of 1987 but still leaves primary responsibility for nonpoint source pollution with the states. The Water Quality Act amends the Clean Water Act and requires states to develop nonpoint source control programs and activities. Section 319 requires states to (1) assess the extent to which nonpoint sources cause water quality problems and (2) develop programs for addressing these problems.

EPA is charged with reviewing and approving the state assessments and management program plans. EPA is also required to prepare an annual report to the Congress on the status of activities and programs implemented to control nonpoint source pollution and the progress made in reducing nonpoint source pollution.

Sections 319(b)(2)(F) and 319(k) of the act acknowledge that certain federal programs or activities may have an effect on state efforts to control nonpoint source pollution by authorizing states to review certain federal projects and activities under the procedures in Executive Order 12372 to determine whether they conflict with the states' nonpoint source management programs. Under the executive order, if a state determines a proposed federal activity or project is not "consistent" with its management program, the federal agency must accommodate the state's concerns or explain in a timely manner why it cannot do so.[4]

Objectives, Scope, and Methodology

On January 4, 1989, the former Chairman and former Ranking Minority Member, Subcommittee on Investigations and Oversight, House Committee on Public Works and Transportation, asked us to determine whether federal programs and activities were inhibiting state efforts to control nonpoint sources of pollution. On the basis of subsequent discussions with Subcommittee staff, we agreed to answer the following questions:

- What barriers are inhibiting state and local nonpoint pollution control efforts; in particular, what federal programs are causing or contributing to state and local problems in controlling nonpoint sources of pollution?
- What actions can EPA take to help better focus federal efforts on reducing nonpoint pollution?

[4]As explained in ch. 4, however, if the federal agency chooses not to make changes in its program, the state cannot force the agency to do so.

The barriers inhibiting nonpoint source pollution control efforts are discussed in chapters 2 and 3. The actions we believe EPA should take to improve nonpoint source pollution control efforts are discussed in chapter 4.

Our work in addressing these issues largely consisted of (1) examining studies of the nonpoint source pollution problem and (2) interviewing a variety of federal and state officials in selected states and federal regions. Among the key studies examined were (1) America's Clean Water, the States' Nonpoint Source Assessment 1985, by the Association of State and Interstate Water Pollution Control Administrators, (2) Results of the Nationwide Urban Runoff Program, issued in 1983 by EPA, and (3) A Report to the Congress: Activities and Programs Implemented Under Section 319 of the Clean Water Act—Fiscal Year 1988, EPA's latest nonpoint source report. In addition, we relied upon recent GAO work examining specific aspects of the nonpoint source pollution problem. This work included, for example, analysis of the U.S. Department of Agriculture's (USDA) management of its water quality activities. We also reviewed some states' nonpoint source assessment reports on file at EPA headquarters.

During the review we obtained information on the following key questions concerning specific sources of nonpoint source pollution: (1) What is the environmental problem; (2) What federal policies, programs, and activities contribute to it; (3) What are EPA and other cognizant federal agencies doing to help deal with it; (4) What are states and/or local governments doing to resolve it; and (5) What remaining problems need to be addressed.

Interviews and fieldwork included contacts with officials at EPA headquarters, four EPA regions, and several states within the regions. The regions we visited—Philadelphia, Chicago, San Francisco, and Seattle—were selected to obtain insights into a variety of pollution sources, including urban runoff, resource extraction, silviculture, and agriculture. To obtain additional insights into specific issues regarding these pollution sources, we visited six states within these regions—California (agriculture), Maryland (urban runoff), Minnesota (agriculture), Oregon (agriculture, particularly grazing issues), Pennsylvania (resource extraction), and Washington (silviculture).

We also contacted officials at USDA and the Department of the Interior's Office of Surface Mining Reclamation and Enforcement at their headquarters and field offices. In addition, we contacted several other organizations, such as the Puget Sound Water Quality Authority, EPA's Chesapeake Bay Program Office, the Columbia River Intertribal Fisheries Commission, and the Association of State and Interstate Water Pollution Control Administrators. We also contacted representatives of a variety of environmental groups including the Sierra Club, Wilderness Society, Resources for the Future, Natural Resources Defense Council, and the Oregon and Washington Environmental Councils.

Our review work was conducted from May 1989 through July 1990 and was performed in accordance with generally accepted government auditing standards. The views of EPA and state officials responsible for the programs discussed in this report were sought during our review, and we have incorporated their comments where appropriate. In accordance with the wishes of the requesters' offices, however, we did not solicit formal comments from EPA on a draft of this report.

Chapter 2

Barriers Impeding State Efforts to Control Nonpoint Source Pollution

The diversity and pervasiveness of the nation's nonpoint source pollution make it particularly difficult for the federal government to identify its causes and implement comprehensive solutions. Still, we found that certain federal policies and activities act as barriers to state and local efforts to deal with the problem. Removal of these barriers can go a long way toward helping to resolve the problem.

In other cases, we found that key barriers impeding state and local nonpoint source control efforts may not be directly attributable to federal activities. In a number of these instances, however, EPA and other agencies are missing opportunities to play a constructive role in helping state and local governments advance their control efforts. Of particular importance is the need for federal assistance in resolving data deficiencies and in developing necessary pollution criteria and standards.

Among the key barriers to state and local efforts to control nonpoint source pollution are the following:

- The way federal agencies pursue their primary missions can conflict with state water quality goals. The problem is most evident at USDA. Among the USDA programs that have inadvertently affected water quality are its crop price and income support programs and its timber programs.
- Vital monitoring data are missing on both the scope and impact of the problem and on the effectiveness of potential solutions. Without sufficient scope and impact information it would be difficult for public officials to reallocate resources towards the most serious problems and to convince landowners of the need for action. Without information on the effectiveness of corrective actions, it has been difficult to ensure that scarce resources are used in the most cost-effective manner.
- "Criteria documents" and other technical information are not available to states to enable them to set water quality standards for nonpoint source pollution. Such standards would allow states to identify (1) the level at which a pollution problem requires attention and (2) whether corrective actions are having their intended effect. State and federal officials told us that existing state water quality standards need to be supplemented because they were developed primarily to address point source problems and consequently have limited applicability in controlling nonpoint source pollution.
- The sheer magnitude of nonpoint source pollution dwarfs the resources available to deal with it, even with the best control efforts by federal, state, and local government. While available federal and state funding is on the order of millions of dollars, serious efforts to correct the

problem—even specific problems in limited geographical areas—would cost billions.

Agency Policies Conflict With Water Quality Goals

How federal agencies pursue their primary missions can inadvertently conflict with the Clean Water Act's objective to protect and restore the quality of the nation's waters. The conflict is especially true for USDA because some of its most significant programs and activities involve—and even promote—activities that can lead to increased nonpoint source pollution. Chief among these programs are the Department's farm commodity price and income support programs and timber harvesting programs.

Policies for Agricultural Commodity Programs Contribute to Water Pollution

USDA's commodity programs stabilize, support, and protect crop prices and farmer income.[1] Commodity programs are a dominant force in agriculture, with more than two-thirds of all U.S. cropland enrolled in these programs. All farmers growing eligible crops are entitled to participate in the farm programs. All crop price and income support programs rely on the concept of an acreage base planted with a given commodity and a proven program yield for those base acres.[2] The acreage base is the average of the acreage that is planted, or "considered planted,"[3] in the program crop during the previous 5 years. The program yield is the average crop yield for the 5-year period from 1981 to 1985, dropping the highest and lowest yields. Farmers are not allowed to plant more than their base acreage in a program crop as long as they are participating in the farm program. Farmers for some program crops may opt to plant less of a program crop, but they will receive reduced payments. Land not planted must be devoted to conservation uses that involve measures to protect land from weeds and erosion. Common measures include growing grass and leaving crop residue on the ground.

The crop acreage base system gives participants limited flexibility to grow other program or nonprogram crops. A farmer growing a program crop cannot plant any other program crop unless that farmer also has a crop acreage base for that crop (the "cross-compliance" provision). For

[1]Program-supported commodities include feed grains, wheat, soybeans, cotton, tobacco, peanuts, rye, rice, sugar, wool, mohair, honey, and dairy products.

[2]See "Impact of Commodity Policy on Alternative Agriculture" in the National Research Council, Alternative Agriculture (Washington, D.C.: National Academy Press, 1989), page 69.

[3]Land is "considered planted" if it is taken out of production to comply with program requirements or if it could not be planted because of weather or other conditions.

example, a participating farmer growing corn would lose benefits for the corn program if the farmer also grows wheat on those acres but does not have an established wheat acreage base.

In a February 1990 report,[4] we noted that such requirements reinforce farmers' use of conventional farming practices and that many of these practices contribute to soil erosion and water pollution. A major problem involves the specialization in program crops year after year, which the program encourages by basing benefits on historical crop production levels. This practice depletes the soil and leads to pest problems, which, in turn, may lead to a greater need for agrichemicals, including synthetic fertilizers and pesticides. By the same token, these program provisions make it economically difficult for farmers to adopt alternative practices (i.e., crop rotation, maintaining protective soil cover, and use of resistant crops) that would reduce agrichemical use and soil erosion.

USDA has recognized that the existing commodity programs tend to discourage adoption of crop rotation that would reduce the use of fertilizers, pesticides, and other chemicals. The Department has proposed changes to the 1990 farm bill to allow farmers to plant and harvest any combination of program crops or to plant but not harvest legumes, grasses, and other soil-building crops without loss of benefits.

USDA has also acknowledged that its programs affect water quality and has initiated, in recent years, several measures to deal with the problem. In its January 1989 report, A National Program for Soil and Water Conservation: The 1988-1997 Update, USDA established water quality as its second priority, behind controlling soil erosion on rural lands, giving it greater attention in a variety of agency programs such as research, education, and technical and financial assistance.

USDA subsequently began its Water Quality Initiative, which is designed to determine the relationship between agricultural activities and groundwater quality and to develop and encourage the adoption of economically effective agricultural and agrichemical management practices that protect water quality. To accomplish these goals, USDA plans to operate programs in three areas: (1) research and development, (2) data base development and evaluation, and (3) education and technical assistance.

[4]Alternative Agriculture: Federal Incentives and Farmers' Opinions (GAO/PEMD-90-12, Feb. 16, 1990).

USDA expects its Water Quality Initiative to be more comprehensive than prior water quality efforts. Whereas previous programs historically focused on the effects of soil runoff on surface waters, the initiative addresses agricultural chemicals and groundwater contamination, in addition to general concerns about agricultural nonpoint source pollution.

The initiative is also expected to be better coordinated than prior water quality efforts, which were managed using a decentralized, agency-by-agency approach. For this initiative, USDA developed a 5-year Water Quality Program Plan. Many of the initiative's activities will be joint efforts among a number of USDA agencies, and involve EPA, the U.S. Geological Survey, and state and local entities as well. In addition, intradepartmental committees are responsible for the ongoing coordination of each of the initiative's activities. All the agencies involved in the initiative will participate in coordinated evaluations of their respective activities.

While these steps signify that the Department is beginning to better manage and coordinate its water quality activities, we concluded in a previous report that USDA needs to improve its focus on water quality responsibilities if it is to achieve its water quality goals.[5] We noted that the major portion of USDA's water quality activities are still being planned and implemented at the Under and Assistant Secretary level, agency-by-agency, providing limited interaction between agencies' program planning or implementation. Although USDA has established a Working Group on Water Quality, it does not have authority to monitor overall water quality progress and to change the direction of programs, if necessary. Also, it is unclear who is responsible for coordinating with other departments and agencies. To deal with these problems, we recommended that USDA establish a permanent, full-time, departmentwide, focal point to oversee the planning, implementation, and evaluation of all its water quality programs and activities.

[5]Agriculture: USDA Needs to Better Focus Its Water Quality Responsibilities (GAO/RCED-90-132, July 23, 1990).

Forest Service Policies Have Traditionally Emphasized Timber Production Over Environmental Protection

Silviculture, the management of forest land for timber, can affect water quality in several ways. For example, erosion and mud slides can occur when soils and hillsides are disturbed by falling timber, logging machinery, towed logs, and logging road construction and use; streams may be polluted by waste timber and brush; shading vegetation may be removed, resulting in increased water temperatures and injury to cold water gamefish; and water quality may also be degraded by applications of pesticides, fertilizers, and fire retardants to forest lands.

The Forest Service, part of USDA, is one of the nation's largest land managers and timber producers. The Forest Service reported that, as of September 1989, it managed and protected a 191-million acre National Forest System—an area nearly as large as the 14 eastern states from North Carolina through New England. (See fig. 2.1., pg. 20-21.) In 1982 the Forest Service reported that in the western states, approximately 56 percent of all commercial timber land was under federal control. These lands contain not only timber but also much of the spawning and rearing habitat for the nation's fisheries. The national forests in California, Idaho, Oregon, and Washington contain about 50 percent of these states' salmon and steelhead trout spawning and rearing habitat.

The Forest Service is responsible for balancing the potentially conflicting objectives of harvesting timber while protecting the water quality on these lands. On one hand, the Service is required to provide a steady flow of timber to help meet the nation's need for wood products. On the other hand, it is required to protect and develop the national forests' other resources such as soil and water, and fish and wildlife. The protection of fishery resources from the potentially harmful impacts of timber harvesting is accomplished primarily through the restriction of timber activities in and around streams.

Environmental groups have consistently maintained that the Service has emphasized timber production at the expense of protecting water quality and other environmental goals, and they cite as evidence the way the Forest Service allocated its resources, with most of the agency's budget devoted to timber harvesting, and only a small amount to its fish and wildlife, and soil and watershed management programs. Forest Service officials acknowledge this historical funding emphasis. The Budget Coordinator on the Headquarters' Fisheries and Wildlife staff estimated that the agency's timber program has traditionally been funded at 85 to 90 percent of its requirements while the programs that protect and develop the forests' other resources have generally received 60 to 65 percent of their funding requests. Other Forest Service officials also told

us that meeting timber harvest quotas has been a very high-priority activity for forest supervisors. They said these quotas have previously sent a message throughout the agency that timber production is more important than the protection of other resources such as water quality or fisheries.

Nevertheless, the Forest Service may be lessening its traditional bias towards timber production. For example, Forest Service officials told us that several actions have been taken in recent years, including reducing the size of clear cuts, implementing silvicultural best management practices, and using buffer strips along streams. Also, funding for the agency's watershed and air management, and wildlife and fisheries programs has been substantially increased in recent years. The watershed and air program increased 54 percent from fiscal year 1987 to fiscal year 1990, and the wildlife and fisheries program increased 98 percent for the same period. Forest Service officials acknowledged, however, that even with the increases in the fish and wildlife program, fish and wildlife activities are still underfunded.

Figure 2.1: National Forest System of the Forest Service

Source: U.S. Forest Service, May 1988.

Information Deficiencies Restrict States' Ability to Deal With the Problem

Important monitoring data are missing on both the scope and impacts of nonpoint source pollution and on the effectiveness of potential solutions. State and local officials need information on the extent of the problems to educate landowners (and the public at large) on the impact of their activities and on the need to prevent such problems. Information on the effectiveness of corrective actions is needed to identify whether such actions are having their intended result or whether revised strategies are needed.

Extent of the Problem Is Not Known

We have identified data deficiencies on the extent of the nonpoint source pollution problem. In particular, we noted data deficiencies on (1) mining discharges from abandoned noncoal mines in Western states and (2) silvicultural activities in Washington State that illustrate the need for better information.

Abandoned and Inactive Noncoal Mines

In a 1976 study, an EPA contractor found that 80 percent of the nonpoint source pollution from inactive and abandoned ore and mineral mining areas was occurring in five states—California, Colorado, Idaho, Missouri, and Montana. These states' recent nonpoint source assessments and discussions with state officials confirm that inactive and abandoned noncoal mines and their associated wastes continue to pollute thousands of stream miles. The principal pollutants from these mines and mine waste piles were acid mine drainage, heavy metals, and sedimentation. According to state officials, however, the data upon which these determinations are based represent only a portion of the historic noncoal mining problems in these states. For example, a Colorado official said that the state had studied the environmental impact from about 8,000 abandoned noncoal mines but that the mines studied were only a small portion of the total estimated number of 50,000 abandoned/inactive mines in Colorado.

A task force of the Western Governors' Association recently identified abandoned/inactive noncoal mines as a major pollution problem but noted that data collection efforts are needed to better define the extent of the problem. In response to this concern, officials in EPA's Office of Solid Waste stated that EPA will provide funding to the states so they can identify available data on these mines.

The Congress has recognized the problem of abandoned noncoal mines and the need to develop data about it. In October 1989, the House of Representatives passed H.R. 2095, Abandoned Mine Reclamation Act of

1989. Among other things, H.R. 2096 would create a fund to be administered by the Department of the Interior. Federal grants from the fund would be used by the states to reclaim noncoal abandoned mines. To participate in funding, a state would be required to develop an inventory of land and water resources that have been harmed by past noncoal mining and are in need of reclamation.

Silviculture Impacts

Because Washington State does not have sufficient data, it may not know the extent of nonpoint source pollution from silviculture. In its August 1989 report, Nonpoint Source Pollution Assessment and Management Program Plan, the Washington State Department of Ecology stated that only 12 percent of the state's approximately 40,000 river miles and 26 percent of its 614,000 lake acres have been assessed. Furthermore, the Manager of the Nonpoint Source Unit of the Washington Department of Ecology told us that the state's assessment was not representative because the data base contains little information on small streams and remote lakes where silvicultural activity might be causing significant pollution problems. Also, he said that most of the information on the condition of the state's water bodies comes from ambient water quality monitoring stations, which are primarily located and operated to evaluate point sources of pollution and, as such, are of limited value in identifying nonpoint source pollution problems.

Also in its 1989 report, the state noted that there is an absence of adequate monitoring data and that silvicultural nonpoint source pollution problems are probably being underreported. It also states that silvicultural activity is affecting only 1 to 3 percent of the state's impaired rivers, yet in 1982 the Forest Service reported that commercial forest lands covered about 42 percent of Washington's land mass. State officials said their ability to develop specific corrective actions is limited because data are not adequate to identify and locate each pollution problem. Similarly, Forest Service officials are developing management plans for timber sales, grazing allotments, and other proposed activities on federal land within the state without comprehensive stream quantity and quality information.

Both Washington State and Forest Service officials acknowledge that limited data complicate decisions on whether forest operations will negatively impact water quality. However, they are implementing programs to augment the information they have. The Manager of the Nonpoint Source Unit of the State's Department of Ecology stated that he will use water quality data from field monitoring of silvicultural impacts on state and privately owned forests to build on the limited information

currently available from the fixed sampling stations. In addition, he stated that the Department is negotiating with the Pacific Northwest Region (Region 6) of the Forest Service to obtain more monitoring information on the condition of state waters located in the national forests.

The Forest Service plans to inventory the condition of a small part of the approximately 20,000 miles of rivers and streams in the region. The detailed river/stream inventory will cover approximately 10 percent of the region's miles of rivers and streams over the next 2 years. Forest Service Region 6 officials stated that this inventory will look at the waterways in relation to the state's water quality standards and at the general condition of the waters as fishery resources. It will note such things as the location and condition of spawning areas, the presence and size of pools, the existence and condition of habitat structures and obstructions to fish passage, and the location of places where sediment accumulation could become a problem. The Manager of Washington State's Nonpoint Source Unit stated that the Forest Service's inventory efforts have a long way to go but that its initial effort represents a reasonable start. It will take a lot of resources to inventory some 2,000 miles of waterways, particularly considering the extra efforts involved such as habitat evaluations that are more extensive than basic water monitoring. Forest Service officials told us that although better information will be helpful, the Forest Service does not have to wait for this information before taking action to control nonpoint source pollution. They are already implementing best management practices because prevention of problems is more productive than trying to clean up after damage has occurred.

Information on Effectiveness of Nonpoint Source Corrective Actions Is Often Missing

In our August 1988 report,[6] we noted that to ensure that limited funds are being spent where they will have the greatest impact, information is needed to measure the effectiveness of EPA programs. We emphasized that the lack of such information was aggravated by reductions in environmental monitoring activities and problems with the quality of data that are collected. We maintained that these problems hamper EPA's ability to detect and assess changes in the environment.

Federal and state officials also told us that before necessary resource investments can be made to deal with nonpoint source pollution, they need some indication that the corrective actions planned will have their

[6]Environmental Protection Agency: Protecting Health and the Environment Through Improved Management (GAO/RCED 88-101, Aug. 16, 1988).

intended effect. To obtain such assurances, they maintain that they need basic monitoring data identifying the cause of the problem and the effectiveness of alternative actions to control it. However, such activities are generally not being undertaken.

Information Deficiencies Caused Largely by Inadequate Monitoring

The major cause of information deficiencies on both the extent of the nonpoint source problem and the effectiveness of corrective actions is the lack of monitoring data. According to EPA's National Water Quality Inventory: 1988 Report to Congress, for example, pollution levels have been assessed for only 20 percent of the nation's coastal miles, 29 percent of the stream miles, and 41 percent of the lake and reservoir acres. Moreover, the available data often focus on point sources of pollution rather than nonpoint sources. EPA acknowledged this problem in its August 1989 A Report to the Congress: Activities and Programs Implemented Under Section 319 of the Clean Water Act—Fiscal Year 1988, noting that the nation has focused largely on impacts caused by traditional point sources because these discharges were causing major, visible problems in our nation's waters.

EPA has also acknowledged that the absence of monitoring data on the effectiveness of corrective actions has been a major barrier to controlling nonpoint source pollution. For example, EPA's September 1987 report, Surface Water Monitoring: A Framework for Change, noted that information gaps preclude water quality managers from assessing the environmental benefits of nonpoint source management actions and point source controls. The EPA report further noted that the agency does little ambient (in stream) monitoring to determine if programs or "best management practices"[7] are working as they were designed. It added that without data on the effectiveness of alternative actions, little incentive exists to make mid-course corrections to programs or policies that may not be working as originally planned.

Federal and state officials in some of the states we visited generally substantiated the lack of effectiveness monitoring. Without information on the effectiveness of corrective actions, these officials generally questioned whether implemented best management practices are as effective as they are thought to be. According to these officials, money is seldom available to carry out programs and to monitor for their effectiveness

[7]Best management practices are methods, measures, or practices to prevent or reduce water pollution, including but not limited to, structural and nonstructural controls, and operation and maintenance procedures.

but such monitoring is needed to ensure that actions taken will have their intended effect.

States Lack Technical Information Needed to Develop Water Quality Standards

State water quality standards are a key element of EPA's and the states' programs to control nonpoint source pollution because they are needed to identify at what level a pollutant concentration becomes a problem. They are also needed to measure the effectiveness of actions taken to control nonpoint source pollution. However, EPA has not developed technical information or "criteria" upon which standards to control nonpoint source pollution are based.[8] EPA has issued some water quality criteria to guide states in developing surface water quality standards. However, current state standards are generally oriented towards point sources of water pollution and often do not adequately measure nonpoint source pollution impacts. EPA has not developed criteria for groundwater, and water quality standards do not exist at all for many pollutants in groundwater.

Current Standards Oriented Toward Point Source Problems

While state water quality standards for surface waters exist for many pollutants, Forest Service, Bureau of Land Management, Oregon, and Washington State water quality officials told us that these standards were generally developed for point source pollutants, and need to be modified and supplemented to deal with nonpoint source pollution. For example, Forest Service officials told us that their best management practices for dealing with silvicultural nonpoint pollution are measured against point-source oriented state standards for water temperature, turbidity (presence of suspended solids such as sediment), and dissolved oxygen. As such, these standards are usually established numeric thresholds that are applied uniformly. According to these officials, this approach should be modified for nonpoint source pollution because it does not allow for uniqueness in site-specific requirements, the influence of natural occurring conditions, natural variability, or pre-existing conditions.

Forest Service officials explained that important factors in identifying and delineating nonpoint source pollution impacts are not fully addressed in turbidity and water temperature standards. Pollution standards for surface waters do not address the impacts that certain nonpoint sources of pollution can have on the physical condition of a

[8]Criteria information is scientifically derived values that establish in-stream water quality conditions that protect the ecosystems. EPA develops criteria to protect aquatic life and human health.

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stream and the aquatic community that inhabits it. For example, sediment can blanket the bottom of a stream and smother aquatic plants and fish eggs, and it could make site-feeding and breathing more difficult for resident fish and aquatic insects. Although they believe sediment needs to be controlled, Forest Service officials stated that it is hard to determine and set reasonable, numeric sediment thresholds because of naturally occurring conditions and differences between areas and over time. Also, they cannot guarantee that unusual storm events will not result in standard violations. In summary, they want EPA's existing standards modified and supplemented with additional standards that will improve nonpoint source pollution control for silviculture while at the same time allowing for reasonable timber operations.

According to Forest Service officials, nonpoint source pollution may also be controlled by limiting the extent of change made to the populations of aquatic insects and fish as a result of activities that produce nonpoint source pollution. Because different aquatic organisms react to various types of pollution in different ways, periodic surveys of a stream's organisms can indicate changes in the quality of the water and help to identify the probable nature and sources of pollution. To use this approach, biological standards are needed to indicate what aquatic populations would be in streams of good quality so they can be used as a frame of reference in determining if a stream's organisms are being degraded. Forest Service officials said few states have developed such standards to aid in the control of nonpoint source pollution.

EPA has known for some time that the control of nonpoint source pollution would require different approaches and tools than those used to address the nation's point source problems. It has also acknowledged that states would need help with the criteria upon which development of water quality standards is based. However, the agency has chosen not to emphasis development of water quality criteria that are specifically tailored to the needs of nonpoint source pollution control, focusing its efforts instead on point source pollution.

In April 1990, EPA published national guidance on developing biological standards that requires states to develop and establish these standards in the next 3 years. In addition to biological standards, EPA officials acknowledge that sediment standards and other nonpoint source-oriented standards need to be established. In its 1989 Nonpoint Sources: Agenda for the Future, EPA indicated that it will continue research on this problem and will issue additional criteria for selected waters within the next 3 years.

Groundwater Standards Are Often Missing or Inadequate

While standards for surface waters are needed to better measure the impacts of nonpoint source pollution, no federal program currently exists to develop groundwater criteria upon which standards are based. Such standards are important, however, because (1) nonpoint source pollution can contaminate groundwater as well as surface waters and (2) groundwater is the source of approximately half the nation's drinking water and accounts for almost all drinking water supplies in rural areas. Two of our recent reports have documented that, in the absence of technical EPA support in this area, many states lack information to develop adequate standards to protect groundwater from such problems.

In a 1988 report, we noted that state standard-setting activities were hampered by a lack of technical information from EPA.[9] In addition to having inadequate information upon which to base adequate standards, states often duplicate one another's efforts in collecting and analyzing information. We concluded that additional information about contaminants should be developed and disseminated if state standards are to be developed in an efficient and technically sound fashion.[10]

In a subsequent report, we noted that in the absence of EPA groundwater criteria, many states rely on federal drinking water standards as groundwater standards.[11] However, we found that the appropriateness of doing so is debatable—in the large majority of the locations we examined, groundwater quality surpassed the drinking water standards for all substances measured. In such instances, the adoption of drinking water standards as groundwater protection standards would potentially allow degradation of a considerable amount of groundwater.

To assist state groundwater standard-setting activities, we recommended in our March 1988 report that EPA provide the needed technical information through a "criteria document program."[12] EPA maintained

[9]See Groundwater Standards: States Need More Information From EPA (GAO/PEMD-88-6, Mar. 16, 1988).

[10]A 1989 report by the National Governors' Association made similar observations, noting that while EPA had made some progress in providing health risk guidelines for some agricultural contaminants, the limited number of guidelines complicated the efforts of many states to protect their groundwater. See Managing Agricultural Contamination of Ground Water: State Strategies (Washington, D.C.: National Governors' Association, 1989), p. 18.

[11]See Groundwater Protection: The Use of Drinking Water Standards by the States (GAO/PEMD-89-1, Dec. 20, 1988).

[12]A groundwater criteria document program is a uniform set of information documents that provides the states with a single, centralized reference source for groundwater contaminants.

that such an effort would be too costly and that the same need could be met by consolidating existing information on the health effects and environmental fate of specific substances found in groundwater. We responded at that time, and continue to believe, that without the expanded information base that would be available through such a program, states are left to develop groundwater standards without needed information.

Magnitude of the Problem Dwarfs Resources Available to Deal With It

Officials in five of the states we visited identified the lack of resources as a key barrier to controlling nonpoint source pollution. Although some states have or will allocate millions of dollars to deal with the problem, they maintain that it would require billions to correct.

Pennsylvania's efforts to clean up a single nonpoint source problem, for example, illustrates how the magnitude of the problem dwarfs resources. Pennsylvania established Operation Scarlift in 1967 to address the abandoned mine problem, including acid mine drainage pollution. According to a state official, Pennsylvania spent $84.5 million on cleanup projects under this program and had only $4.5 million available for new projects at the end of 1988. However, according to the state's nonpoint source assessment report, it has 1,701 stream miles polluted from acid mine drainage, and it will cost between $3 billion and $5 billion just to address acid mine drainage from these abandoned mines.[13]

Other states are attempting to set aside money to address nonpoint source pollution, but their funds are also limited in comparison to the magnitude of the problem. For example, the Manager of the Nonpoint Source Unit in Washington State's Department of Ecology stated that approximately $8.3 million per year will be made available from state funds to address nonpoint source pollution, with an additional $3.5 million annually from EPA funds. He also stated that an additional $4.8 billion will be needed over the next 20 years to upgrade pollution control facilities and equipment and implement management practices to control nonpoint source pollution in Washington State. These funds are needed by state and local agencies to support the development of water quality management plans, information and education programs, and stormwater control, and to conduct monitoring needed to enforce the state's water quality regulations. According to the Assistant Director of

[13]The estimate includes only the cost to treat or otherwise abate polluted discharges originating from these mines. It does not include the cost of full reclamation of all abandoned mine sites in the state.

Water and Standards for the Washington Department of Ecology, state and local governments simply cannot absorb all these costs.

In 1987, the Minnesota Legislature established the Clean Water Partnership Program to protect and improve surface and groundwater in Minnesota. The legislature approved $1.3 million for grants to local units of government. When this money is matched locally, approximately $2.6 million will be available to complete studies and develop implementation plans for controlling nonpoint source pollution. The governor is requesting an additional $4 million from the state legislature for project implementation in the 1990-91 biennium. However, according to the Director, Water Quality Division, Minnesota Pollution Control Agency, approximately $1 billion will be needed to correct Minnesota's nonpoint source pollution problems through the year 2000. Without federal funds to help with this effort, he said that many priority surface waters polluted by nonpoint sources will not be cleaned up.

Conclusions

The diversity and pervasiveness of nonpoint source pollution presents an enormous technical and regulatory challenge to the states. We found that a number of federal policies, programs, and activities, however, have complicated the task. Chief among them are the policies of some USDA programs that have inadvertently conflicted with states' water quality goals, particularly the agency's commodity programs. As noted in this chapter, USDA's Water Quality Initiative will help deal with these problems but improved Department management will also be needed to be effective. Moreover, as we indicate in chapter 4, EPA can play a more constructive role to ensure that water quality concerns are appropriately integrated into national policies and programs.

In addition to the inadvertent impacts of some federal programs and activities, nonpoint source pollution presents data needs and other technical difficulties. These difficulties have impeded the states' ability to monitor and assess the extent of their problems and the effectiveness of potential solutions, as well as to set nonpoint source-oriented standards. Centralized development of the monitoring techniques and standard-setting information at the federal level would be more efficient than on a state-by-state basis. However, EPA has not fully addressed these issues because of resource constraints and its focus on point sources of pollution.

Finally, a fundamental factor underlying the barriers and inhibiting efforts to deal with nonpoint source pollution is the sheer magnitude of

the problem in comparison to the resources available to deal with it. While funds available to the states are on the order of millions of dollars, serious efforts to correct the problem—even specific problems in limited geographical areas—would cost billions.

Chapter 3

Addressing Nonpoint Source Pollution by Coping With Sensitive Land Use Issues

One of the most difficult issues impeding efforts to control nonpoint source pollution is the political sensitivity associated with controlling land use practices that inadvertently cause nonpoint source pollution. Unlike point source discharges that can be more easily identified and regulated with pollutant discharge permits, nonpoint source pollution results from land use practices of millions of property owners and other individuals. In some cases, nonpoint source pollution can only be controlled by preventing certain land uses. In others, nonpoint source pollution can be controlled if land uses are practiced in an environmentally acceptable manner.

As noted in chapter 1, despite the states' authority to control land uses, land use controls tend to be considered a local community tool. As a result, any restrictions by the states, and the federal government in particular, tend to be controversial. Nevertheless, while political sensitivity over land use regulation remains a preeminent barrier in efforts to control nonpoint source pollution, an increased openness toward dealing with the issue is emerging as awareness of the seriousness of the problem has grown. We found a number of recent and innovative activities showing that (1) sensitive political land use issues are more likely to be confronted successfully when people are given good information about the risks nonpoint source pollution poses to their health and the environment and (2) controls required during development rather than after development are generally less expensive and politically more acceptable.

EPA recognizes in its Nonpoint Sources: Agenda for the Future that land use controls are a big hurdle to controlling nonpoint source pollution and that it needs to support state and local governments as they make difficult land use decisions. Chapter 4 discusses additional measures EPA should be taking to help regulators at all levels of government deal with land use issues associated with nonpoint source pollution.

Agriculture: Greater Reliance on Land Use Provisions to Protect Water Quality

Farm owners have traditionally resisted the idea of regulations governing whether or how to farm their lands. The agricultural community has long believed that pollution control can be done through various voluntary means. USDA has generally responded with a variety of programs that provide government funds, education, and technical assistance to farmers to encourage them to implement erosion controls that are consistent with environmental goals.

As indicated the 1989 National Governors' Association study, however, many people—including the general public—criticize voluntary programs as ineffective.[1] Farmers may favor regulatory controls over a voluntary program in some cases. For example, public attitude polls in Iowa during 1986, at a time when groundwater contamination was becoming a priority issue, showed that more than 75 percent of Iowa residents were in favor of regulatory limits on farm chemicals—a surprisingly large figure for a state with a large farm economy. Other studies also criticize voluntary programs as ineffective because of low participation, little incentive for farmer participation, and economic disincentive to participation. (Participation may be discouraged, for example, when a farmer's return on an investment in a best management practice is lower than his cost.)[2]

In recent years, however, an increasing awareness of agriculture's environmental impact has led the Congress to include more direct means of discouraging land uses considered detrimental to the environment. The Food Security Act of 1985, for example, authorized USDA to implement the Conservation Reserve Program (CRP), a program to remove up to 45 million acres of highly erodible cropland from production by 1990. Under this program, the Secretary of Agriculture can enter into contracts with producers to remove such cropland from production for 10 to 15 years in return for annual rental payments.

USDA originally implemented this program primarily for erosion control but modified it in 1988 to more directly address water quality concerns. At that time, the agency expanded the CRP eligibility criteria to include "filter strips"[3] for cropland that pose a substantial threat to the degradation of water quality. Additional measures being considered in connection with the 1990 farm bill would expand use of the CRP to deal with water quality concerns.

In addition to CRP, other provisions of the Food Security Act made receipt of most federal farm benefits—commodity price supports, agricultural credit, and crop insurance—contingent on land stewardship practices. For example, under the conservation compliance provision,

[1] Managing Agricultural Contamination of Ground Water: State Strategies, p. 6.

[2] For example, see Poison Runoff: A Guide to State and Local Control of Nonpoint Source Water Pollution, (New York: Natural Resources Defense Council, 1988) pp. 48-50.

[3] Filter strips are 66- to 99-foot-wide fields located adjacent to streams and bodies of water, which when planted with grass, shrubs, or trees reduce the amount of sediment and chemicals entering surface waters.

producers with highly erodible lands that are not enrolled in CRP must develop certain conservation practices to reduce erosion on these acres to continue receiving federal farm benefits. However, in our March 1990 testimony before the House Agricultural Committee's Subcommittee on Department Operations, Research, and Foreign Agriculture,[4] we concluded that USDA had relaxed the implementing regulations for the compliance provision and had thus reduced the incentive for producers to enroll their most highly erodible land in CRP. As a result, about 70 percent of the most highly erodible land eligible for CRP has not been enrolled through 1988.

Another key environmental provision of the act is the "swampbuster". Swampbuster attempts to protect the nation's wetlands by denying federal farm program benefits to producers who plant an agricultural commodity on wetlands converted to cropland after December 23, 1985.[5] However, producers do not lose program benefits until they actually plant on the land they drained or modified. Thus, under the act, farmers can drain wetlands and receive benefits as long as they do not plant a crop. In our recent report,[6] we suggested that the Congress consider amending the law that currently allows conversion of fragile lands without loss of benefits until an agricultural commodity is actually planted. Furthermore, we suggested that wetlands converted for planting be restored or the damage mitigated in order for participants to regain their eligibility for farm program payments.

Some States Have Enacted Their Own Agricultural Land Use Restrictions

In addition to this gradual acceptance of some form of agricultural land use regulation at the federal level, some states have enacted their own agricultural land use restrictions to control nonpoint source pollution. A clear motivating factor in these initiatives has been a recognition that a serious water quality problem exists for which voluntary actions alone are not sufficient.

One of the more innovative state land use statutes is Wisconsin's "Bad Actors" law. The statute was enacted with the strong support of farmers who had voluntarily invested in best management practices to

[4]General Accounting Office's View on Conservation Provisions of the 1990 Farm Bill (GAO/T-RCED-90-49, Mar. 15, 1990).

[5]Wetlands can improve water quality by trapping sediment and removing pollutants such as nutrients, pesticides and other toxic substances.

[6]Farm Programs: Conservation Compliance Provisions Could Be Made More Effective (GAO/RCED-90-206, Sept. 24, 1990).

control water pollution, but who had their efforts undermined by a few of their neighbors who had not cooperated. Under the law, a non-cooperating farmer may eventually be regulated more stringently as a "point source" discharger (i.e., subject to monitoring and discharge limits) if participation is not forthcoming. The Chief of the Nonpoint Source and Land Management Section of the Wisconsin Department of Natural Resources stated that the law has been primarily used thus far to control animal waste and construction runoff. He noted that the law focuses on the most severe situations because enforcement actions are time-consuming and staffing is limited.

The 1989 National Governors' Association study provides some additional examples of state land use restrictions to control agricultural water pollution, noting that such restrictions have generally arisen over concerns about contamination of drinking water supplies.[1] The study describes a 1987 Maine statute to illustrate new state efforts to address agricultural pollution. The study states that the statute, prompted by numerous severe cases of pesticide contamination of both air and water, requires that land used for agriculture must be registered with the local authorities. The registration includes a statement of crops grown, chemicals used, and chemical application methods employed. Registration allows local authorities to enforce a 150-foot buffer zone around agricultural land, in which no new development may take place. The new law also requires that current neighbors be notified of the request for registration. The neighbors may appeal the eligibility of the land for registration.

Nevertheless, the study notes that while states have authority to control land use for groundwater protection purposes, land use controls, per se, tend to be considered a local matter. Consequently, many states have amended their zoning enabling legislation to authorize local governments to make groundwater protection a legitimate purpose of zoning. Significantly, the study notes that some states' zoning legislation "grandfathers" existing uses and therefore exempts them from regulatory changes. It therefore concludes that land use controls are of potentially greater use in controlling future land use patterns that may adversely affect groundwater than they are in controlling or limiting current land uses.

[1]See Managing Agricultural Contamination of Ground Water: State Strategies, pgs. 6, 8, and 23.

Resource Extraction: Preventing Long-Term Pollution Problems Through Early Consideration of Land Use Implications

Examination of the impacts of abandoned mines in Pennsylvania and the state's regulation of active mines as point sources reinforces the view that anticipating and preventing the effects of potentially harmful land uses is often far more effective than remediating these effects once they occur.

Coal mining activities occurred prior to the Surface Mining Control and Reclamation Act of 1977 and resulted in significant environmental degradation—scarred landscapes, abandoned mines, massive coal refuse piles, and streams polluted by acid mine drainage. In its recently completed nonpoint source assessment, Pennsylvania estimated that it would cost $13 billion to $15 billion to reclaim its coal mines abandoned prior to 1977 and correct the acid mine drainage from these mines.

Because states' mining laws afforded widely varying degrees of protection, the Congress enacted the Surface Mining Control and Reclamation Act of 1977 to better protect the environment from the adverse effects of coal mining. Under the act, a permitting program was created that required site evaluations, including examination of the hydrology of the site. The act prescribes uniform, minimum environmental protection standards and concurrent land reclamation requirements to control the surface effects of both underground and surface mining operations. Among its requirements, the act calls for the posting of a bond by the mine operator to ensure that funds will be available to reclaim a site when it becomes inactive.[6] In addition, the act requires the establishment of a process to identify land areas of the state as unsuitable for all or certain types of surface coal mining operations.

Costly Water Quality Problems Not Considered in Early Permitting Decisions

As with other coal mining states, the full requirements of the 1977 act did not apply to Pennsylvania until the early 1980s, when the state obtained approval to operate its regulatory program ("primacy" program) from the Department of the Interior's Office of Surface Mining Reclamation and Enforcement. The period from 1977 to 1982 was Pennsylvania's "interim" program period, when the full requirements of the act were not yet in effect and reclamation standards were less stringent.

[6]We have reported, in a number of reports, deficiencies in the activities of the Department of the Interior and the states in implementing the act's requirements. These deficiencies included inadequate oversight by the Department of the states' primacy programs and inadequate state program activities in such areas as bonding, inspections, and enforcement.

In 1986,[9] we reported that operators in Pennsylvania had forfeited bonds on mining sites primarily from the interim program and that the state had insufficient funds from the bonds for reclaiming these sites. At the time of that report, no reclamation had been performed by the state on about 15,000 acres with environmental problems, including water pollution and soil erosion. Since then, the state has reclaimed some sites with the assistance of funds provided from the state's general revenues and has provided remining permits for other sites that will be reclaimed by new operators. However, as of October 1989, Pennsylvania still had about 15,000 acres with forfeited bonds in which no reclamation action had been performed by the state as a result of additional bond forfeitures occurring primarily in the interim program.

Moreover, in reclaiming these forfeited sites, Pennsylvania does not correct major water pollution problems that are occurring on some of them. According to an official of the state's Bureau of Abandoned Mine Reclamation, many significant acid mine drainage problems cannot be corrected because of the expense of building treatment facilities and providing perpetual maintenance of these facilities.

In addition to unreclaimed sites in which operators have forfeited bonds, the Director of the Pennsylvania Bureau of Mining and Reclamation expressed concern about a large number of additional inactive mines (in both the interim and primacy programs) that have discharges requiring treatment. In these cases, the operators have not yet forfeited their bonds and the state is holding the bonds to ensure that the owners will treat the discharges. However, according to the Director, the bonds held on these sites will not cover the cost of treating the discharges. The Bureau estimated that the total cost for treating all discharges from identified inactive surface and underground mines would be between $38 million and $52 million per year.[10]

[9]Surface Mining: Difficulties in Reclaiming Mined Lands in Pennsylvania and West Virginia (GAO/RCED-86-221, Sept. 22, 1986).

[10]Pennsylvania identified discharges from surface and underground mines as well as refuse disposal areas that require treatment to meet the state's effluent standards for coal mining. The annual costs are based on projections for amortizing the construction costs for treatment facilities and the annual maintenance costs over a 50-year period.

Land Use Decisions Are Crucial for Avoiding Future Environmental Damage

According to the Director of the Pennsylvania Bureau of Mining and Reclamation, acid mine drainage's potential burden on the state over the long term has led the Bureau to take a much harder look at each proposed mining site and the site's potential for future mine drainage problems. To approve a permit under the current primacy program, the state must conclude, on the basis of the applicant's hydrologic analysis of the site, that it will not generate post-mining discharges. The Director of the Bureau asserted that the state is doing a better job now of avoiding areas with potential acid mine drainage than it did several years ago, noting that the state was now denying many permits in areas with the potential to develop a discharge.

Urban Runoff: Building in Controls to Prevent Pollution in New Development Areas

The nation's urban runoff problems also illustrate the advantages of incorporating pollution control into the planning of new development rather than deferring controls until after the problem has occurred. Recent regulations proposed by EPA address urban runoff problems primarily in incorporated metropolitan areas. However, EPA and others agree that it is more cost-effective to undertake pre-development evaluations and to implement control measures during development.

Although urban runoff is a diffuse source of water pollution and is considered a nonpoint source, most is accumulated as stormwater and discharged through conveyances, such as stormwater sewers. Since the 1972 amendments to the Clean Water Act, EPA has been required to regulate municipal stormwater discharges as point sources by issuing permits under the National Pollutant Discharge Elimination System. Since 1973, EPA has issued various proposed and final regulations, but no comprehensive stormwater permit program has been implemented because of court challenges and other delays.

Under the 1987 amendments to the Clean Water Act, EPA is initially regulating municipal stormwater systems serving populations over 100,000.[11] In its December 1988 proposal, EPA laid out a number of options, but it indicated that it preferred to include only incorporated cities with populations of over 100,000, and to exclude counties from its definition. In doing so, EPA would exclude about 410 counties with populations over 100,000. According to EPA's proposal, most larger urbanized areas are comprised of one or more core cities surrounded by urbanized areas outside of city boundaries. Generally, the core areas are already

[11]Under the 1987 amendments, all other stormwater discharges cannot be subject to regulation until Oct. 1, 1992.

developed and most new development is occurring outside the boundaries of the core cities.

For example, Fairfax County, Virginia, and Montgomery County, Maryland, have both been high-growth counties in the Washington, D.C., metropolitan area with 1988 Bureau of Census population estimates of 770,200 and 704,900, respectively. Both counties would be excluded from EPA's proposed regulations. EPA favors limiting coverage to incorporated municipalities to avoid the administrative complexities of dealing with (1) the thousands of municipal entities that exist within counties' boundaries and (2) the county governments. EPA points out that the legal authority, institutional mechanisms, and financial capability needed for a successful program do not exist in the case of all municipal entities, and that complex intergovernmental agreements would therefore be required.

The Natural Resources Defense Council criticized this approach, stating in its comments on EPA's proposal, that

"By delaying further the implementation of comprehensive stormwater programs in the areas of the country that are experiencing the most rapid growth, EPA is losing a valuable opportunity to prevent stormwater problems rather than rely on expensive structural controls after development has occurred."

The Council further stated that EPA's Nationwide Urban Runoff Program identified serious stormwater pollution in Nassau and Suffolk Counties on Long Island, New York, yet none of Long Island would be covered automatically under EPA's preferred approach. Finally, the Council pointed out that by justifying its approach entirely on the basis of administrative feasibility, EPA will minimize the number of permit applications during the first phase only to generate a massive influx of applications for all remaining stormwater in the second phase.

Although its preferred approach would apply only to discharges in incorporated municipalities, EPA acknowledges the advantages of expanding coverage to counties. According to EPA's proposal, most of the new development is occurring outside the incorporated cities, and these growth areas offer the most practical opportunities to reduce pollution. In its proposal, EPA stated that defining municipal systems on the basis of county boundaries "would allow municipalities flexibility to address stormwater concerns associated with many areas of rapid development, rather than relying more heavily on retrofitting controls in older urban

core areas defined by city limits." EPA's Nationwide Urban Runoff Program reported that requiring controls in areas under development is much more feasible and cost-effective than requiring controls in more fully developed areas.

Maryland's Stormwater Control Program Focuses on New Development

Some states recognize the importance of implementing stormwater controls during land development. Maryland requires each county and municipality to adopt a stormwater management program designed to maintain the volume and quality of the runoff after development as it was before development.

Under Maryland's legislation, a person is generally not allowed to develop any land for residential, commercial, industrial, or institutional use without submitting a stormwater management plan to the county or municipal jurisdiction. According to the Acting Director of Maryland's Sediment and Stormwater Administration, each jurisdiction has established procedures for the review, approval, inspection, and enforcement of the plans. These program requirements apply only to new construction.[12]

Silviculture: Combining Mandatory and Voluntary Land Use Controls

Forest Service Region 6 officials and the Manager of the Nonpoint Source Unit for the Washington State Department of Ecology told us that Washington is a major timber-producing state and a key area for spawning fish, including various species of salmon. Headwaters are critical habitats for young game fish and the insects upon which they feed. They said that these headwaters can be degraded by heavy sedimentation from improper timber harvesting, which, in turn, can devastate fish's spawning areas.

To protect water quality and fish, the Manager said Washington State has developed a coordinated approach to land use controls for nonpoint source pollution from silvicultural activities, which includes both regulatory and voluntary components. Using this program, the state, local, and industry officials believe they will be able to balance timber harvesting goals with water quality protection.

The Manager said the state's Forest Practices Act, the Federal Water Pollution Control Act, and associated regulations set out silvicultural

[12]Also according to the Acting Director, the state appropriated $2.5 million between 1984 and 1989 for grants to local communities to retrofit stormwater devices on developed sites.

best management practices and water quality conditions that must be adhered to. A voluntary Timber, Fish, and Wildlife Agreement negotiated between state agencies, Indian tribes, environmentalists, and timber industry representatives is the other component of the state program. Parties to this agreement promised to use a more flexible approach to improve the normally required best management practices. For example, they allowed more cutting of trees in a riparian zone because the plan provided for putting gravel in the stream bed, thus providing for greater fish enhancement.

Also, the members agreed to place additional land use restrictions on timber harvesting activities near the banks of streams, rivers, and lakes in order to better protect fishery habitat; to voluntarily preserve certain timber lands for upland wildlife management areas; to correct and restore previous habitat degradation; and to submit planned timber harvests for review and amendment to meet site-specific requirements for additional environmental protection measures. This agreement also established a framework for continued research, monitoring, and evaluation of whether implemented practices are protecting water quality.

Washington's silvicultural nonpoint source control approach shows how landowners, land users and government regulators can work cooperatively to balance the inherent conflict between timber production and environmental protection. As a result, Washington's approach has been cited as a model for other groups and states to consider in resolving their own land use conflicts.

Conclusions

Land use practices and patterns, so often at the root of nonpoint source pollution problems, have been among the most difficult barriers for states to overcome in dealing with nonpoint source pollution. Resolving these problems often requires developing technical solutions such as improved best management practices. Perhaps even more challenging, however, is the fact that solutions require a reorientation of basic values that have often placed private property rights above other considerations—such as the unintended water quality impacts of alternative land uses.

Political sensitivity over land use remains a formidable barrier to dealing with the nonpoint source problem. However, an increased openness has emerged at all levels of government to confront the issue as society has become increasingly aware of the extent of the nonpoint

source problem. Our review has identified a number of innovative programs and activities to address the problem, particularly at the state and local level.

These activities vary from one type of nonpoint source pollution problem to another, but they have at least two important traits in common. First, as illustrated in the discussions concerning agriculture, urban runoff, and resource extraction, it is both less expensive and politically more acceptable to build in appropriate land use controls as development takes place rather than after it has already occurred. Second, the public is much more likely to support such measures when they have better information about the risks that the problem poses to their health and environment. As we elaborate in the following chapter, we believe that short of imposing its own federal land use regulatory program, EPA can help state and local land use control efforts by more effectively identifying and publicizing the nature and extent of nonpoint source pollution problems, and by developing the standards and other technical information state and local regulators need to apply controls.

Chapter 4

Strengthening EPA's Efforts to Control Nonpoint Source Pollution

EPA cannot be expected to solve the nonpoint source pollution problem alone, given the magnitude and diffuse nature of the problem. As previous chapters have noted, resolving this problem will depend on other federal agencies as well as EPA. State and local government and individual landowners also will have a significant role, particularly where land use issues are involved.

Still, as the nation's lead environmental organization for implementing the Clean Water Act, EPA is in a singular position to assume a principal role in coping with the problem. EPA acknowledges this responsibility in its Nonpoint Sources: Agenda for the Future, published in January 1989. That document presents an ambitious framework for EPA's efforts to deal with nonpoint source pollution for fiscal years 1989 through 1993. EPA declared that its agenda's goal is to provide strong leadership for the national nonpoint pollution control program and help states and local governments overcome barriers to successful implementation of nonpoint source measures.

Nevertheless, we believe EPA's agenda will remain largely unfulfilled if the agency remains on its present course. Resource constraints are an underlying problem, as they are in many environmental programs. However, in the case of nonpoint source pollution, the problem may reflect inappropriate funding priorities as well as shortages in absolute terms. EPA's budgetary priorities are overwhelmingly oriented toward controlling point sources of pollution despite the fact that (1) the agency identifies nonpoint source pollution as the primary cause of the nation's remaining water quality problems and (2) its own studies show that the comparative risks posed by nonpoint source pollution are at least as high (and are often higher) than the risks posed by point sources. We believe this imbalance needs to be addressed if many of the corrective actions discussed in this chapter are to be implemented.

In this chapter, we discuss EPA's plans for dealing with the key problems identified in this report, the problems likely to inhibit these efforts from succeeding, and our recommendations for developing an EPA agenda for the 1990s that will more effectively address nonpoint source pollution.

Resolving Conflicts Between Federal Agencies' Policies and Water Quality Goals

Policies of federal programs in pursuit of their primary missions conflict with water pollution control goals and are a major barrier to controlling nonpoint source pollution. We noted that the problem was of particular concern with USDA's commodities programs because agriculture is the primary contributor to the nation's nonpoint source pollution problems.

EPA acknowledges the problem in its Nonpoint Sources: Agenda for the Future but indicates that (1) the Water Quality Act provides states with the authority to help alleviate this problem through its "federal consistency provision" and (2) EPA is improving its coordination at the federal level with agencies whose activities affect water quality. Nevertheless, we found that several states in EPA's Regions 3 and 10 do not believe the federal consistency provision can realistically deal with the major water quality problems posed by federal activities. Moreover, while EPA has made some progress in coordinating with USDA, the problems posed by conflicting federal agency policies remains a formidable one for state nonpoint source pollution programs.

Federal Consistency Reviews Not a Serious Option for States in Resolving Conflicts With Federal Agencies

EPA's agenda points out that the federal consistency provision is a key tool for resolving conflicts between federal programs and state nonpoint source control activities. This provision is intended to help the states influence federal policies, projects, and activities that conflict with the policies, standards, and activities in their nonpoint source management programs. If the state determines that a proposed federal policy, activity or project is not "consistent" with its management program, the federal agency must accommodate the state's concerns or explain in a timely manner why it cannot do so.

However, state officials in EPA's Region 10 indicated that the consistency review process was of little use to them at this point. They noted that states have only just begun to implement their nonpoint source programs and that they do not wish to confront federal agencies. State officials in EPA's Regions 3 and 10 questioned whether individual states could effectively challenge the policies of major federal programs (e.g., USDA's commodity programs). Instead, the provisions may be useful only for questioning individual federal projects in a single watershed (i.e., the building of a new military base in an environmentally sensitive area). They maintained that broader issues are better handled by EPA at a national level.

The Chief of EPA's Nonpoint Source Control Branch acknowledged to us that the consistency provision in the Water Quality Act is somewhat limited in that it does not provide the states with a veto power over federal activities. He noted that the provision, in effect, acts as an informational requirement and basis for state-federal negotiation rather than a regulatory tool.

Improving EPA's Coordination With Federal Agencies Affecting Water Quality

EPA's agenda identifies the importance of EPA's role in developing a stronger partnership with other federal agencies and in ensuring that federal regulatory requirements are imposed in a way that aids states in implementing their nonpoint source control programs. EPA has made some progress in this respect with USDA—the agency whose activities probably have the greatest impact on water quality. For example, the Chief of EPA's Nonpoint Source Control Branch noted that EPA has been working with USDA agencies to ensure better coordination between the states' 319 programs and USDA water quality projects. State water quality managers are encouraged to propose USDA projects that will address state nonpoint source problems. In addition, EPA has developed personnel-sharing arrangements with some USDA agencies. Most EPA regions have had their single nonpoint source coordinator augmented by experienced Soil and Conservation Service staff members. The Forest Service has also provided a staff member in one EPA region. EPA officials have told us that these additional staff members have been able to provide program insights and have developed excellent nonpoint source materials.

While this effort helps to improve EPA-USDA coordination, EPA needs to encourage greater USDA consideration of nonpoint source pollution impacts in its policy development. To some extent, USDA has begun to address these issues through its Water Quality Initiative. However, as noted in chapter 2, it will take some time before the Department's initiative can resolve the fundamental water quality problems created by its programs. EPA officials have emphasized this point in our interviews and have acknowledged that they need to oversee USDA's performance and ensure that USDA's Water Quality Initiative has its intended effect.

Furthermore, while progress with USDA is important, it is only 1 of approximately 31 federal agencies with responsibilities for water-related activities. Some of these agencies' activities, such as highway projects sponsored by the Department of Transportation, also pose significant nonpoint source pollution problems. To deal with the federal establishment as a whole, EPA has led an intergovernmental nonpoint

source pollution task force that has brought together numerous agency officials to discuss nonpoint source conflicts and opportunities for interagency cooperation. However, the task force has not met since October 1988 because EPA wants to focus on a few key agencies. Also, the Chief of EPA's Nonpoint Source Control Branch stated that resource constraints have prevented the agency from pursuing the problem beyond the limited efforts underway to deal mainly with agriculture-related nonpoint source pollution. He noted that the limited EPA nonpoint pollution staff has had to devote most of its resources to developing program guidance and reviewing state assessments and management plans and section 319 grant proposals.

Developing Nonpoint Source Pollution Criteria and Standards

As indicated in chapter 2, a variety of federal and state officials have told us that they lack the technical "criteria" information needed to develop water quality standards. Such criteria are needed to identify at what concentration a pollutant becomes a problem and to measure the effectiveness of best management practices in controlling nonpoint source pollution.

The need for additional criteria has been recognized by EPA. Nonpoint Sources: Agenda for the Future acknowledges EPA's responsibility in this area, noting, for example, that "EPA needs to concentrate on providing states with sound information that allows them to develop and apply these new criteria." When asked why they were only now beginning to be developed, a Section Chief in EPA's Criteria and Standards Division told us that it was a matter of setting priorities. He explained that the Clean Water Act's initial requirements were oriented to controlling chemical pollutants from point sources, and, therefore, this is where the agency placed its initial emphasis. The next major effort was to get standards in place to control toxic pollutants. The last and current priority is to develop criteria for establishing water quality standards that better measure the impact of nonpoint source pollution.

An environmental scientist who formerly worked in EPA's Criteria and Standards Division added that it has taken considerable time to develop nonpoint source criteria and standards because an approach different from the one used for point sources is required. Point sources, for example, were easily identifiable pollution sources that were amenable to control through uniform limitations on their discharges. Additionally, the effectiveness of such controls could be easily measured; a limited number of entities were involved; and the cost of control measures was easily transferable to the public. In the nonpoint arena, he said, there

are innumerable sources that are not easily identifiable; the pollution is not as amenable to uniform control criteria; and the cost of control will not be easily transferable to the public.

Compounding these problems are continuing budgetary constraints and competing demands. The Chief of EPA's Monitoring Branch in its Assessment and Watershed Protection Division noted, for example, that EPA is trying to help states and agencies establish appropriate standards for nonpoint source pollution as well as monitoring techniques, but EPA has limited resources to do all the needed work. Faced with such constraints, the agency has not been able to do all it would have liked in developing monitoring techniques and nonpoint source criteria.

Monitoring Needed to Identify the Extent of Pollution and Effectiveness of Corrective Actions

EPA also acknowledges the importance of developing better information on both the extent of the nonpoint source problem and the effectiveness of actions needed to correct the problem. Without information on the effectiveness of corrective actions, we believe it is difficult for federal agencies to determine whether such actions are having their intended effect or whether revised strategies are needed. Without information on the extent of the problem, it is also difficult to convince people of the seriousness of the nonpoint source problems and actions needed to correct them.

EPA's Nonpoint Sources: Agenda for the Future acknowledges that a key part of the problem is the need for EPA to develop better monitoring techniques, or "protocols," for use by the states. These protocols would be specifically designed to evaluate nonpoint source impacts on the environment. This report and other EPA documents note that, not surprisingly, most of the monitoring performed has focused on point source data. EPA's 1988 National Water Quality Inventory, for example, notes that monitoring has historically been oriented towards detecting chemical pollutants from point sources by periodic samples at fixed stations. The Inventory notes that nonpoint source monitoring is more complex and costly because it is often episodic and unpredictable, varying from long-term, low-level inputs to high-level concentrated pulses. As noted above, an EPA official told us that limited resources are preventing EPA's Monitoring Branch from fully developing nonpoint source monitoring techniques.

Even though better criteria and monitoring information can help the nonpoint source control effort, EPA officials pointed out that control measures can and should be implemented before this information is

fully developed. This is especially important because it is easier to prevent nonpoint source pollution than it is to clean it up. Therefore, they said they will emphasize the implementation of best management practices as much as possible. But without statutory authority to require such practices, this approach will take time.

Public Education Efforts Need to Be Expanded

To persuade the public to support controversial land use decisions and make other sacrifices, a clearer connection must be made between individual activities, land use practices, and local water quality. However, while there are some notable exceptions, a lack of public understanding about the problem has been a major obstacle to dealing with nonpoint source pollution.

EPA plans to persuade the public about the need for action on nonpoint source pollution by encouraging states and local governments to adopt targeted watershed management approaches for specific rivers, streams, and drainage basins. On the basis of the experiences of special initiatives—the Chesapeake Bay, the Great Lakes, the Clean Lakes Program, and the National Estuary Program—EPA has found that it is much easier to build public consensus for action when people feel they are protecting a water resource that is of particular value to them.

Nevertheless, the agency recognizes that a broader public education effort would be needed to deal with nonpoint source pollution nationwide as opposed to solving the problem of a selected watershed. Its Nonpoint Sources: Agenda for the Future calls for the development of a detailed workplan for a program to help states and local governments develop public awareness programs. Among other things, it calls for EPA to

- identify and use other federal agencies' data bases/mapping capabilities/programs to assist EPA in developing materials (brochures, videos, public service announcements) that would describe the problem in everyday language;
- enlist other federal programs to communicate with specific audiences;
- enlist the cooperation of private sector parties involved in activities that prevent/contribute to nonpoint source pollution (i.e., agrichemical associations, major trade associations, industry); and
- develop a children's education program to train teachers and provide educational materials in liaison with the federal Department of Education and the states.

Officials in EPA's Nonpoint Source Control Branch stated that public education is one of the highest priorities in their nonpoint source control efforts. They cited several examples of public awareness efforts including a newsletter, national posters, and an information clearinghouse. One official admitted, however, that only a small portion of the agenda had been implemented and much more needed to be done. For example, he noted that nothing has been done to enlist the help of private sector organizations or to develop an educational program. He cited resource constraints as the primary problem that has thus far inhibited EPA's efforts to increase public awareness about nonpoint source pollution.

Low Funding Priority for Nonpoint Source Pollution

As is evident from the discussion above, the major underlying barrier inhibiting EPA's nonpoint source control efforts is the low level of funding afforded nonpoint source pollution control. In an era of constrained budgetary resources, this problem is not unique to nonpoint source pollution—it is a problem shared by nearly all environmental programs. However, such constraints make it all the more important that the environmental risks posed by alternative pollution problems be considered in funding decisions. We acknowledge that risk should not be the only factor considered in allocating EPA's limited resources. For example, EPA's role in controlling point source pollution is inherently larger than it is in controlling nonpoint source pollution, and, therefore, its financial commitment to control of point source pollution is higher. Additionally, the resources needed to control nonpoint source pollution will need to come primarily from states and local communities. However, EPA has not allocated the amounts required to meet the most basic elements of its nonpoint source pollution agenda, such as coordination with other federal agencies. As discussed in this section, EPA's own analyses suggest that this situation inadequately reflects the risk the problem poses. Specifically:

- EPA's comparative risk study shows that nonpoint sources pose a more serious risk to the natural ecosystems than point source discharges.
- EPA's budget priorities in water pollution control are, nevertheless, oriented overwhelmingly toward point source pollution problems.
- EPA maintains that states have flexibility to support nonpoint source pollution control activities through various supplemental funding sources, even though most of these sources are, in fact, largely unavailable for nonpoint source funding.

EPA Studies Show Nonpoint Source Pollution Poses Serious Health and Environmental Risks

In an August 1989 report assessing the comparative risks posed by alternative pollution problems, EPA found that risks posed by nonpoint source pollution are generally more serious than those posed by pollution discharges from point sources.[1] The study, based on analyses by 3 of EPA's regions in conjunction with the agency's Office of Policy, Planning, and Evaluation, began with a list of 18 to 24 of the most important environmental problems facing each region. Each region then analyzed and ranked each problem in terms of its relative health and ecological risk.

The results of the assessment should be interpreted with caution since the risk posed by alternative problems cannot be quantified with precision. Nevertheless, the study's conclusions about the relative importance of nonpoint source pollution compared with point source pollution showed the following:

- Health risk. Point sources and nonpoint sources of water pollution appear to pose roughly comparable risks, with point source discharges indicated as a higher health risk in some instances and nonpoint source discharges as higher in other instances. Among the key health risks associated with nonpoint source pollution was bacteriological contamination of shellfish.
- Ecological risk. Nonpoint source pollution was clearly identified as a more serious problem by two of the three regions and a comparable risk by the third region. Regions cited data indicating that nonpoint sources degrade more water bodies than point sources. The study indicated that ecological risks from specific types of nonpoint source pollution vary considerably by region. For example, it noted that the effects from silviculture pollution were higher in the Northwest (Region 10) than in the Mid-Atlantic area (Region 3) but that the reverse was true for nonpoint source effects from mining.

The study identifies a number of reasons why such a discrepancy may exist. It notes, for example, that resource levels tend to be more closely aligned with how serious EPA perceived the problem to be in the past, rather than with the risks they pose now. Reflecting the political realities within which federal agencies must operate, it also notes that the agency's priorities tend "to align more closely with public opinion and its embodiment in legal mandates than with risk." The Director of EPA's Office of Regulations and Standards substantiated this observation, explaining that, among other factors, the agency's budgetary priorities

[1]Comparing Risks and Setting Environmental Priorities (Washington, D.C.: EPA, Aug. 1989).

reflect statutory mandates that place greater emphasis on point source control programs rather than on its nonpoint source programs.

EPA Devotes Water Quality Funds Primarily for Point Source Activities

In commenting on the funding priority devoted by the three regions to these and other pollution problems, the EPA study noted that "The Regional rankings sometimes contrast very sharply with the relative levels of Regional resources devoted to these different problem areas." It cited the imbalance between point and nonpoint sources of pollution as an example, noting that

> "In the water quality area, nonpoint sources and habitat modification cause the greatest problems. Yet the bulk of program resources are devoted to municipal and industrial point sources . . . ."

We found these observations to be consistent with the overall budgetary picture regarding EPA's funding of nonpoint source control activities. Although nonpoint sources of pollution are recognized as the leading reasons for polluted waterbodies, EPA continues to spend the vast proportion of its water pollution control funds on point source pollution. For example, less than 6 percent of fiscal year 1990 funding for the agency's point source- and nonpoint source-related water pollution control activities were devoted to nonpoint-related activities.[2] Moreover, as noted in table 4.1, EPA has requested only $22 million out of the $400 million authorized by the Water Quality Act for funding under section 319 for the period of fiscal years 1988 through 1991. As also noted in table 4.1, EPA's first request for section 319 funding was in fiscal year 1990, in which it requested $7 million and the Congress appropriated $38.9 million.

[2]Based on estimates provided by EPA officials. The funds included both EPA salaries and expenses and federal grants to states and local governments.

Table 4.1: Funding Under Section 319 of the Water Quality Act

Dollars in millions

Fiscal year	Authorized	Requested	Appropriated
1988	$70	$0	$0
1989	100	0	0
1990	100	7[a]	38.9
1991	130	15	[b]
Total	**$400**	**$22**	

[a]In fiscal year 1990, the President's budget requested $7 million under another section of the act for the states to implement their management plans under section 319.

[b]As of Sept. 1990, fiscal year 1991 funds for EPA had not been appropriated.

Other Sources of Funding Cited by EPA May Not Be Available for Nonpoint Source Control Activities

EPA officials have explained their limited funding requests for the nonpoint source program by noting that sufficient funds were available under other sections of the act to fulfill section 319's requirements for developing nonpoint source pollution assessments and management programs. For example, in June 1989 testimony before the Subcommittee on Environmental Protection, Senate Committee on Environment and Public Works, EPA's Acting Assistant Administrator for Water stated that nonpoint source funding was allowable under the new State Revolving Loan Fund program. EPA is authorized to award grants to the states to capitalize their revolving funds to provide loans but not grants for the construction of wastewater treatment plants. Under that program, EPA maintained, states could structure their loan programs to fund nonpoint source controls and to finance implementation of the states' management programs.[5]

While these funds are nominally available to implement management plans, information from both EPA and the states we visited indicates that the funds will generally be needed by local communities for the construction or modification of wastewater treatment plants. In its recent nonpoint source annual report to the Congress, for example, EPA noted that states were unlikely to use such discretionary authority for nonpoint source management programs "largely because of the high priority accorded to construction of publicly owned treatment works." Indeed, according to EPA's 1988 Needs Survey Report to Congress, the capital investment or costs necessary to meet the nation's municipal wastewater treatment requirements under the Clean Water Act will exceed $83 billion for the design year (2008) population. State and local

[5]State revolving funds will replace funding under EPA's Construction Grants program, which will not be funded after fiscal year 1990.

officials have expressed concern over whether state revolving loan funds will be sufficient to replace the existing construction grants.

Overall, most of the states in our review reported that construction grant allotments and the revolving funds will be largely unavailable to fund nonpoint source control activities because these funds will have to be devoted to construction of wastewater treatment plants.

Conclusions

The magnitude and diversity of nonpoint source pollution make it particularly difficult to control. Unless the problem is addressed, however, little progress will be made in attaining the nation's water quality goals.

This report has identified a number of problems at the federal level that inhibit state and local efforts to deal with nonpoint pollution. In certain instances, federal policies and activities act as unintended barriers to state and local efforts to deal with the problem. Removal of these barriers (e.g., reducing the incentives in USDA crop subsidy programs that encourage agrichemical use) can go a long way toward helping to resolve the problem. In other cases, EPA and other agencies may be missing opportunities to play a constructive role in helping states advance their nonpoint source pollution control efforts. Such cases involve assistance in resolving data deficiencies and in developing necessary pollution standards.

As the nation's environmental organization with primary responsibility for implementing the Clean Water Act, EPA should be taking a leading role in coping with nonpoint source pollution by working with other federal agencies and providing state and local governments with the vital information they need to pursue their nonpoint source control activities. While the agency has published an ambitious agenda to accomplish this objective, that agenda stands little chance of being fulfilled. Resource constraints are an underlying problem, as they are in many environmental programs. However, in the case of nonpoint source pollution, the agency's own analyses suggest that its resource problems may reflect inappropriate funding priorities: EPA's budgetary priorities are overwhelmingly oriented toward controlling point sources of pollution despite the fact that (1) the agency identifies nonpoint source pollution as the primary cause of the nation's remaining water quality problems and (2) its own studies show that the comparative risks posed by nonpoint source pollution are at least as high—and in some respects are clearly higher—than the risks posed by point sources.

We recognize that, in the past, point source pollution may have been the more significant problem and, accordingly, may have warranted substantially greater attention. However, point source pollution is now substantially regulated, and the impact of nonpoint source pollution is now better understood. We also recognize that the agency cannot identify its own priorities regardless of congressional mandates to address other environmental problems. However, we do believe that it is incumbent upon EPA, as the nation's lead environmental organization, to do more to influence its priorities, according to its assessment of relative environmental risk, than it has in the past. We are not suggesting that EPA funds be allocated among its point and nonpoint source programs on a strictly "dollar-for-dollar basis" with perceived risk. EPA's role in controlling point source pollution is larger than it is for nonpoint source pollution and, therefore, the federal financial commitment is higher. On the other hand, the resources to control nonpoint source pollution need to come largely from states and local communities.

We believe the agency needs to pursue its ongoing efforts to identify the relative risks of nonpoint source pollution with other environmental problems; identify funding levels that consider environmental risk; and work with cognizant congressional committees to establish funding priorities that will allow the agency to pursue a more effective nonpoint source agenda for the 1990s. In this connection, we also believe that the Congress should consider allocating greater water quality funding to the control of nonpoint source pollution to better reflect the importance of this problem to the goal of cleaning up the nation's polluted waterways.

Recommendations to the Administrator, EPA

To address the nation's water pollution problem in a manner that better reflects the risks posed by nonpoint source pollution, we recommend that the Administrator, EPA, identify appropriate funding levels that will allow the agency to pursue key objectives of an effective nonpoint source agenda that have heretofore made little progress under existing funding constraints. Specifically, the Administrator should set funding levels that will allow the agency to accelerate its efforts to

- resolve problems arising out of conflicts between the policies of federal agencies and water quality goals;
- develop nonpoint source pollution criteria so the states can develop and implement nonpoint source water quality standards;
- develop monitoring techniques to help states determine the extent of their nonpoint source pollution problems and the effectiveness of corrective actions; and

- develop its program to educate the public about the health and environmental impacts of nonpoint source pollution.

Matter for Consideration by the Congress

In light of (1) the importance of nonpoint source pollution as a primary cause of the nation's remaining water quality problems and (2) the overwhelming emphasis of EPA resources devoted to point source programs, the Congress may wish to consider allocating EPA's water quality funding during the fiscal year 1992 budget process to provide greater emphasis on controlling nonpoint source pollution.

Appendix I

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